Hawaiian Electric Company, Inc. • PO Box 2750 • Honolulu, HI 96840-0001

July 14,1997

Ms. Bertha Leong
Chairperson
Kuliouou-Kalani Iki Neighborhood Board
450 Hind Drive
Honolulu, HI 96821

Dear Ms. Leong:

Thank you for allowing Hawaiian Electric Company (HECO) to present the Honolulu City Line project to the Kuliouou-Kalani Iki Neighborhood Board on July 3, 1997. We have researched your concern about possible effects on pacemakers and found that a 138 kV overhead transmission line will not affect individuals with pacemakers.

According to the U.S. Food and Drug Administration, electric and magnetic field interference at **very high** levels may interfere with the general function of various medical devices including electronic cardiac pacemakers and implantable defibrillators. For this reason, the American Conference of Governmental Industrial Hygienists (1994) has stated that workers with cardiac pacemakers should not be exposed to magnetic fields greater than 1 Gauss (1000 mG) or an electric field greater than 1 kilovolt (1000 volts) per meter. Please note that these limits are **much higher** than the general public and our employees would be exposed to by a 138kV overhead transmission line.

The susceptibility of present-day pacemakers and defibrillators to interference from power-frequency EMFs was also reported on at the 1997 Electric Power Research Institute (EPRI) Seminar. Dr. Antonio Sastre, Principal Scientist at the Health Assessment and Research Center, Midwest Research Institute reported,

> "Present-day models are considerably less susceptible to power-frequency magnetic fields than models that caused alarm during the 1970s."
>
> "I did not find any reports of malfunction of pacemakers or defibrillators at electric field intensities of less than 1kV/m or magnetic field intensities of less than 1 Gauss."

Susceptibility of Pacemakers and Defibrillators to Power-Frequency Electric and Magnetic Fields
1997 EPRI EMF Seminar, New Orleans, Louisiana

Let me reassure you that HECO has and will continue to design and construct all 138kV overhead transmission lines to ensure the safety of the public and our employees. We understand that our customers continue to be concerned about electric and magnetic fields and recognize that it is our responsibility to address this concern.

Thank you again for allowing us to present the Honolulu City Line project to your Board. If you have any further questions, please feel free to call me at 543-7059.

Sincerely,

Kerstan J. Wong
Project Manager

KJW

c: Mr. Tom Jezierny (Vice President, HECO)

Hawaiian Electric Company, Inc. 820 Ward Avenue, WH4-JA, Honolulu HI 96814

FAX

Date: 07/02/97
Number of pages including cover sheet: 18

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REMARKS: ☐ Urgent ☐ For your review ☐ Reply ASAP ☐ Please comment

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To: Members of the EEI EMF Task Force

From: Rick Loughery, Director, Environmental Activities

Subject: Publication of National Cancer Institute (NCI) Study of Magnetic Fields and Childhood Leukemia

Date: July 2, 1997

The NCI study "Residential Exposure to Magnetic Fields and Acute Lymphoblastic Leukemia in Children" will be published in tomorrow's (July 3, 1997) issue of *The New England Journal of Medicine* (NEJM). An editorial entitled "Power Lines, Cancer, and Fear" also will be published in the July 3, 1997 **NEJM**. Attached for your interest are materials distributed at an NCI press briefing earlier today as well as EEI's press release on the study.

Due to copyright provisions, EEI cannot copy and distribute the **NEJM** articles. It is EEI's understanding that studies published in the **NEJM** are available to the public after 8 a.m. EDST on publication day by fax for a fee (amount unknown) by calling **1 800 THE NEJM** (843-6356).

Please call me at 202/508-5647 if you have questions. Thank you.

News
EDISON ELECTRIC INSTITUTE
The Association of Investor-Owned Electric Companies
701 Pennsylvania Avenue, N.W. ▲ Washington, D.C. 20004-2696

FOR IMMEDIATE RELEASE

FOR FURTHER INFORMATION:
John Castagna, 202-508-5661
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NATIONAL CANCER INSTITUTE STUDY ENCOURAGES UTILITIES ON EMF SAFETY

Washington, D.C. (July 2) – An authoritative new study by the National Cancer Institute is another convincing piece to the puzzle of how to help people understand the possible health effects of nearby power lines, according to the top environmental official of the nation's largest electric utility trade association.

"The National Cancer Institute's findings are welcome news for parents everywhere," said David Swanson, Senior Vice President of Energy and Environmental Activities for the Edison Electric Institute (EEI). "It builds on the conclusions last autumn by the National Academy of Sciences of insufficient evidence to consider EMF a threat to human health."

Swanson's statement on behalf of the nation's electric utilities followed release of a study by the National Cancer Institute in *The New England Journal of Medicine*. The study found "little evidence" that electric and magnetic fields (EMF) play any role in the incidence of childhood leukemia.

"As we approach the new millennium, pieces of the puzzle are being put together so that people alarmed by EMF scares are getting the sound science they need to assuage their concerns," Swanson said. "This study is not the last word on EMF but it is an encouraging signal that solid science may be winning its battle to earn an important role in public policy decisions."

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EEI is the association of investor-owned electric companies. Its members generate and distribute more than three-quarters of the nation's electricity.

Cancer Research
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PRESS BRIEFING
NATIONAL CANCER INSTITUTE/ CHILDREN'S CANCER GROUP STUDY OF MAGNETIC FIELDS AND CHILDHOOD LEUKEMIA

July 2, 1997
Natcher Building Conference Center
Conference Room F
National Institutes of Health

Scientists from the National Cancer Institute and the Children's Cancer Group will discuss the results of their study on residential magnetic field exposures and childhood leukemia appearing in the July 3 issue of *The New England Journal of Medicine*. This is the most comprehensive study ever done on this much-debated topic.

Speakers: Robert N. Hoover, M.D., Sc.D., Director of NCI's Epidemiology and Biostatistics Program, will moderate the press briefing.

Martha S. Linet, M.D., of NCI's Radiation Epidemiology Branch, will present the results of the study.

Leslie L. Robison, Ph.D., Professor of Pediatrics at the University of Minnesota and chairman of the Epidemiology and Cancer Control Strategy Group of the Children's Cancer Group, will discuss the CCG's role in the study.

Lawrence J. Fischer, Ph.D., Director of the Institute for Environmental Toxicology at Michigan State University and chairman of the NCI/CCG study's advisory group, will discuss the role of the advisory group and its evaluation of the results of the study.

Speakers will be available for individual interviews after the briefing

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Cancer Research
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National Institutes of Health

EMBARGOED FOR RELEASE
5:00 p.m. EDT
Wednesday, July 2, 1997

NCI Press Office
(301) 496-6641

Study Finds Magnetic Fields Do Not Raise Children's Leukemia Risk

A comprehensive study by researchers from the National Cancer Institute (NCI) and the Children's Cancer Group (CCG) found no evidence that magnetic fields (EMFs)* in the home increase the risk for the most common form of childhood cancer.

In this case-control study, the researchers found that, in general, children who lived in homes with high measured magnetic fields were not significantly more likely to be diagnosed with acute lymphoblastic leukemia (ALL) than children living in homes with lower magnetic field levels. Nor was ALL found to be more likely among those whose homes were classified in high categories of "wire-code," a surrogate measure of magnetic fields that is based on the thickness, configuration, and distance from the home of nearby power lines.

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* Both electric and magnetic fields are present around power lines and electrical appliances. Recent interest and most research studies have focused on potential health effects of magnetic fields. The reason is that several prior epidemiologic studies have found associations between surrogate measures, particularly wire codes (based on power line thickness, configuration, and distance between power lines and homes), which are more closely related to magnetic than electric field levels.

(more)

"The results of our study differ from three earlier U.S. studies in that we found no evidence of a significantly increased risk of ALL among children whose main residence or residence during pregnancy was classified in the highest wire code category," said lead investigator Martha S. Linet, M.D., of NCI's Radiation Epidemiology Branch. The results are published in the July 3 issue of the *New England Journal of Medicine.***

Whether power frequency magnetic field exposures (EMFs) may increase cancer risk has been a controversial question, and nearly two decades of research has produced conflicting results. EMFs exist naturally inside the human body and in the surrounding environment. But stronger fields are produced by power lines and electric appliances, which have been the focus of most research. Recent research has focused on magnetic fields, specifically the 60 cycle-per-second (60 hertz) fields produced by alternating current (AC) in household electrical power.

The first study to suggest a risk from magnetic fields was published in 1979, when researchers reported that children who had died from leukemia or other cancers were about two to three times more likely than other children to have lived within 40 meters of a high-current power line. Several other groups of investigators later described similar findings based on proximity to power lines. When researchers have actually measured magnetic fields in children's homes, however, they have not found significantly increased risks of leukemia or other cancers.

Previous studies on magnetic fields and childhood cancer have had one or more shortcomings that make interpretation of their results difficult. These include small numbers of leukemia cases, measurements limited to a single residence, long intervals between leukemia diagnosis and magnetic field measurement, and data collectors aware of which children had leukemia (cases) and which did not (controls).

** The study is titled "Residential Magnetic Field Exposures and Childhood Acute Lymphoblastic Leukemia." The authors are Martha S. Linet, Elizabeth E. Hatch, Ruth A. Kleinerman, Leslie L. Robison, William T. Kaune, Dana R. Friedman, Richard K. Severson, Carol M. Haines, Charleen T. Hartsock, Shelly Niwa, Sholom Wacholder, and Robert E. Tarone. *NEJM*, July 3, 1997.

The NCI/CCG researchers designed their study to overcome these limitations as much as possible. A large study population covering nine states was chosen, and measurement technicians were unaware of case or control status. For most subjects, measurements were made within two years after diagnosis, and were obtained in both current and former residences. The measurements covered homes in which the child had lived for at least 70 percent of his or her life, or 70 percent of the five years immediately before diagnosis for children age 5 and older.

The researchers compared magnetic field exposures of 638 children with leukemia and 620 children without leukemia who were similar in age and race. About 58 percent of the children were under age 5, the age group in which ALL is most common. The participants lived in Illinois, Indiana, Iowa, Michigan, Minnesota, New Jersey, Ohio, Pennsylvania, and Wisconsin.

The researchers estimated magnetic field exposures in two different ways: by measuring fields in current and former homes of the children (including homes their mothers lived in during the pregnancy) and by assigning wire codes to the homes. Slightly less than half of all subjects had summary residential magnetic levels less than 0.065 microtesla (μT)***, close to 20 percent had levels ranging from 0.065 to 0.099 μT, 23 percent had levels ranging from 0.100 to 0.199 μT, and the remaining 12 percent had levels of 0.200 μT or higher.

If magnetic fields increased risk for ALL, the researchers would expect that the higher the measured level of magnetic fields in homes, and the higher the wire code category, the more ALL cases they would find. But in general, they did not see either of these patterns. For children living in homes with magnetic fields measured at 0.2 μT or above, the researchers calculated a slightly elevated, but not statistically significant risk for ALL compared with risk for children living in homes with magnetic fields below 0.065 μT. While risk of ALL appeared to be slightly higher among children residing in homes with high levels, the absence of a consistent pattern of increasing risk with increasing exposure level suggests that the slight increase seen could be due to chance.

*** 1 μT = 10 milligauss (mG). Some studies have reported measurements in mG.

In addition, the researchers found no relationship between wire code classification and risk for ALL. Children with ALL were no more likely than controls to live in homes with high wire-code classification.

The researchers also interviewed mothers of case and control children about the children's electrical appliance use and the mothers' appliance use during pregnancy. Results from this part of the study are still being analyzed and are expected to be published separately in 1998.

"This important study would not have been possible without the close collaboration and commitment of the physicians, nurses, and researchers of the Children's Cancer Group, and the cooperation of the families who participated," said Leslie L. Robison, Ph.D., a co-investigator in the study and professor of pediatrics at the University of Minnesota, Minneapolis. The Children's Cancer Group is a multicenter network of pediatric oncologists and other researchers from 38 institutions and affiliated hospitals who diagnose and treat approximately 50 percent of children with cancer in the United States.

The NCI/CCG study is part of a larger CCG investigation of ALL comprising more than 1,900 ALL cases and 1,900 controls. The larger study, overseen by Dr. Robison, is designed to evaluate the risk of ALL associated with a wide range of factors, including maternal diseases and medication use during pregnancy, childhood diseases, and other exposures such as parental occupation. Results are expected within the next two years.

# # #

For more detailed information on EMF and research on possible health effects, call the National Institute of Environmental Health Sciences' (NIEHS) Environmental Health Clearinghouse at 1-800-NIEHS-94 (1-800-643-4794) to get a copy of the booklet *Questions and Answers About EMF: Electric and Magnetic Fields Associated with the Use of Electric Power*. This publication, produced by NIEHS and the U.S. Department of Energy, is also available on the World Wide Web at http://www.niehs.nih.gov/oc/factsheets/emf/emf.htm.

Cancer Information from the Office of Cancer Communications
National Cancer Institute news releases are available via the Internet through the World Wide Web (http://rex.nci.nih.gov). Click on Mass Media.

Cancer Information Service
The Cancer Information Service (CIS), a national information and education network, is a free public service of the NCI, the Nation's primary agency for cancer research. The CIS meets the information needs of patients, the public, and health professionals. Specially trained staff provide the latest scientific information in understandable language. CIS staff answer questions in English and Spanish and distribute NCI materials.

Toll-free phone number: 1-800-4-CANCER (1-800-422-6237)
TTY: 1-800-332-8615

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For NCI information by fax, dial (301) 402-5874 from the telephone on a fax machine and listen to recorded instructions.

CancerNet™
For NCI information by computer:

CancerNet Mail Service (via E-mail)
To obtain a contents list, send E-mail to cancernet@icicc.nci.nih.gov with the word "help" in the body of the message.

Internet
CancerNet is also accessible via the Internet through the World Wide Web (http://cancernet.nci.nih.gov) and Gopher (gopher://gopher.nih.gov) servers.

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National Institutes of Health

July 2, 1997

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Questions and Answers About the National Cancer Institute/Children's Cancer Group Study of Magnetic Fields and Childhood Leukemia

1. **Why was the study done?**

Acute lymphoblastic leukemia (ALL) is the most common form of cancer in children, accounting for 70 to 80 percent of all childhood leukemias and one-third of all childhood cancers in the United States. Only a small proportion of cases have an identifiable cause. Beginning in 1979, a number of studies have suggested that magnetic fields (EMFs)* may increase risk for ALL, while other studies have found no evidence of risk.

2. **What have been some problems in studying magnetic fields and childhood leukemia? What have earlier studies shown about the relationship of magnetic fields to childhood leukemia?**

The possible relationship of magnetic fields to childhood leukemia has been difficult to study, in part, because there are no known biological effects that could explain how these exposures might increase risk of leukemia in children.

Some investigators have reported that children living in homes close to high tension power lines have a 2- to 3-fold significantly increased risk of ALL, while other studies have found no evidence of an elevated risk. In each study where findings indicated statistically significant excess risk, researchers used surrogate measures of magnetic field exposures

* Both electric and magnetic fields are present around appliances and power lines. But recent interest and research have focused on potential health effects of magnetic fields. This is because studies have found associations between increased cancer risk and power-line configurations which are more closely related to magnetic than to electric fields.

(more)

such as "wire codes" to characterize the thickness, configuration, and distance between the child's residence and nearby power lines. Researchers who have actually measured magnetic fields in homes have found little or no evidence of a significant increase in risk.

Many previous studies had one or more shortcomings such as small numbers of children with leukemia, magnetic field measurements restricted to a single home regardless of the number of homes each child had resided in, a long interval between cancer diagnosis and residential magnetic field measurements, data collectors aware of which children had leukemia and which did not, and differential residential mobility between cases and controls. These limitations have made it difficult to interpret results. The NCI/CCG study was done with the aim of overcoming some of the problems of earlier studies and providing more definitive answers.

3. Who conducted the NCI/CCG study? How was it done? How many children were involved?

The National Cancer Institute (NCI) and the Children's Cancer Group (CCG), a multicenter network of pediatric oncologists and other researchers from 38 institutions and affiliated hospitals in the United States, collaborated on the study, which was directed by Martha Linet, M.D., of NCI's Radiation Epidemiology Branch in the Division of Cancer Epidemiology and Genetics.

The NCI/CCG study was a case-control study: The researchers calculated risk of ALL among 638 children with leukemia (cases) and 620 healthy children (controls). Eligible participants for the residential magnetic field exposure assessment were subjects who resided in nine states: Illinois, Indiana, Iowa, Michigan, Minnesota, New Jersey, Ohio, Pennsylvania, and Wisconsin. Children who participated as controls were matched to the children with leukemia for age, race, and telephone area code and exchange. About 58 percent of the children were under age 5.

A detailed description of the study's methods will be published in the September 1997 issue of the journal *Epidemiology*.

4. How were magnetic fields assessed in the study?

The researchers used an electronic meter and sought to measure magnetic field levels in four rooms in each current and former home of the case and control children. The meter took readings in the child's bedroom every 30 seconds for 24 hours. In addition, 30-second "spot" measurements were made in the bedroom, family room, kitchen, and the room the mother slept in when pregnant with the child. Results of earlier studies by NCI

researchers** showed that combining the measurements from these three to four rooms gives results similar to those obtained by having children wear a portable meter, particularly for children less than 9 years old, who made up 84 percent of those in the study. The researchers also obtained a measurement immediately outside the front door of each home to be used if the family did not allow measurements to be taken inside the home. The earlier studies also revealed that the front-door measurement correlated well with in-home measurements, and thus could be used if in-home measurements could not be taken because access within the home was not permitted.

Eligible subjects were included in the study if magnetic field measurements were obtained in all homes in which the subject had lived for at least 70 percent of his or her lifetime for children under age 5, or at least 70 percent of the five years immediately preceding diagnosis for subjects age 5 and older. The overall measurement determined for each home was assigned a numerical weight that corresponded to the duration of time the subject lived in each home. The individual home measurements were then combined to provide a summary "time-weighted average" magnetic field exposure over each child's lifetime (or the five years prior to diagnosis for children age 5 and older).

In analyzing the results, the researchers split the data into four groups based on time-weighted average exposure to magnetic fields, expressed as microtesla (μT).*** Then they compared the least-exposed group with more highly exposed groups to determine whether risk rises with increasing level of exposure.

The researchers also diagramed the thickness, configuration and distance from the home of nearby power lines, and a computer algorithm used this information to assign a wire code category to each home (*see* Question 2). Two types of wire code classifications were assigned. Similar to the results of previous U.S. studies, the measured magnetic field levels in the NCI/CCG study increased with increasing wire code categories for both wire code classifications. Although less accurate than in-home measurements as an estimate of a child's personal exposure, wire codes have been associated more strongly with childhood cancer than in-home measurements have been in earlier studies.

** Friedman, D.R. et al. "Childhood Exposures to Magnetic Fields: Residential Area Measurements Compared to Personal Dosimetry." *Epidemiology*, March 1996

Kaune, W.T. et al. "Development of a protocol for assessing time-weighted average exposures of young children to power-frequency magnetic fields." *Bioelectromagnetics*, January 1994.

*** 1 μT = 10 milligauss (mG). Some studies have reported measurements in mG.

5. **How does the NCI/CCG study differ from previous studies?**

Most earlier studies, particularly those with in-home measurements, included relatively small numbers of leukemia cases. Small numbers reduce the reliability of results. The NCI/CCG study included four times as many children as the next-largest comparable study. In addition, prior studies often had long intervals, sometimes as long as two or three decades, between leukemia diagnosis and magnetic field measurement, and lacked measurements for homes the children lived in for substantial periods of their lives. In the NCI/CCG study, most measurements were taken within two years of diagnosis, and measurements covered residences the children lived in for at least 70 percent of their lives (or 70 percent of the five years prior to diagnosis for children older than 5). In addition, most earlier studies have been done in a single city or other small geographic area. The NCI/CCG study was conducted in homes in both urban and rural areas across nine states, making it less likely that factors specific to one geographic area will unduly affect the results.

6. **What were the results of the study?**

For children living in homes with magnetic fields measured at 0.2 μT or above, the researchers calculated a non-significant relative risk for ALL (estimated as an odds ratio) of 1.24 compared with children living in homes with magnetic fields below 0.065 μT. In other words, children who lived in homes with magnetic fields levels of 0.2 μT or greater were estimated to have a slightly (24 percent) but non-significantly higher probability of developing ALL than children living in homes with levels below 0.065 μT. The tendency for risk to be slightly higher among children residing in homes with high levels was based on small numbers and was not characterized by a consistent pattern of increasing risk with increasing exposure level.

Similarly, children who lived in high wire-code homes had no higher risk of ALL compared with those who lived in low wire-code homes (relative risk of highest to lowest wire code category estimated as odds ratio of 0.88). This means that those living in homes classified as very high wire code category had a slightly (12 percent) but non-significantly lower risk than those living in homes with nearby power lines that were underground or very low wire code category.

7. **What conclusions can be drawn from the results?**

The researchers conclude that their results do not support the theory that residential magnetic fields cause childhood leukemia, particularly at the levels found in most homes. If high magnetic fields increase risk for ALL, researchers would expect that the higher the measured levels and wire codes in homes, the greater the risk of developing ALL. But in general, they did not see this trend. While the risk of ALL appeared to be slightly higher among children residing in homes with high measured magnetic field levels, the absence of a statistically significant and consistent pattern of increasing risk with increasing exposure level suggests that the excess could be due to chance. The possibility of an increased risk at high levels (greater than 0.3 μT) cannot be entirely ruled out, however. But if this risk is real, it could explain only a small proportion of ALL cases.

Background information on electric and magnetic fields (EMFs) and on childhood leukemia:

8. **What are EMFs?**

Power lines, electrical wiring, and appliances all produce electric and magnetic fields. EMFs are invisible lines of force that surround any electrical device. Electric and magnetic fields have different properties and possibly different ways of causing biological effects. Electric fields are easily shielded or weakened by conducting objects (for example, trees, buildings, and human skin), but magnetic fields are not. The strength of both electric and magnetic fields drops off very sharply within a few feet or inches of a source, such as an electrical appliance.

The earth itself produces EMFs, mainly in the form of direct current (DC) static fields. Electric fields are produced by thunderstorm activity in the atmosphere. Magnetic fields are thought to be produced by electric currents flowing deep within the earth's molten core.

9. **What is power-frequency EMF and how does it compare with other types of fields?**

The electromagnetic spectrum covers an enormous range of frequencies. These frequencies are expressed in cycles per second (hertz). Electric power (60 hertz in North America, 50 hertz in most other places) is in the extremely-low-frequency range, which includes frequencies below 3,000 hertz.

The higher the frequency, the shorter the distance between one wave and the next, and the greater the amount of energy in the field. Microwave frequency fields, with wavelengths of several inches, have enough energy to cause heating in conducting material. Still higher

frequencies like X-rays cause ionization or the breaking of molecular bonds, which damages genetic material. In comparison, power-frequency fields have wavelengths of more than 3,100 miles (5,000 km) and consequently have very low energy levels that do not cause heating or ionization. However, AC fields do create weak electric currents in conducting objects, including people and animals.

10. What happens when a person is exposed to EMFs? Why do scientists disagree about whether EMFs could cause cancer?

EMFs can create weak electric currents in the bodies of people and animals. This is one reason why there is a potential for EMFs to cause biological effects. But the amount of this current, even directly beneath a large transmission line, is extremely small—millionths of an ampere. (An ampere is a unit of electrical current.) The current is not only too weak to damage DNA, but is too weak even to penetrate cell membranes and cause damage inside cells. It is present mostly between the cells.

Currents from 60-hertz EMFs are weaker than natural currents in the body, such as those from the electrical activity of the brain and heart. Some scientists argue that it is therefore impossible for EMFs to have any important effects. Other scientists argue that, just as a trained ear can pick up a familiar voice or cry in a crowd, so a cell may respond to an induced current of low intensity even through the background "noise" of the body's natural currents. Numerous laboratory studies have shown that biological effects can be caused by exposure to EMFs. In most cases, however, it is not clear how EMFs produce these effects.

Because 60-hertz EMFs are too weak to damage the DNA of cells, scientists believe that if EMFs are associated with cancer at all, they must work as cancer promoters. Promoters are agents that can push a cell with DNA or genetic damage closer to the uncontrolled cell growth and division that characterizes cancer.

11. How common is acute lymphoblastic leukemia? Is it treatable?

Of every 1 million children under age 15 in the United States, about 30 are diagnosed with ALL and about five die from ALL each year. About 1,600 children are expected to be diagnosed with ALL this year. The disease is most commonly diagnosed in white children under 5 years old. It is twice as common in white children as in black children, and is slightly more common in boys than in girls.

ALL is much more treatable now than in the past. Most children with ALL can now be cured, and about 80 percent of patients under age 15 survive at least five years after diagnosis, compared with about 1 percent in the 1950s.

12. What are the known risk factors for ALL? What others have been proposed?

Only a few risk factors are known, although many have been proposed and studied. Children with Down syndrome have a greatly increased risk of ALL, reported to be 10 to 40 times the risk of other children. Other, rarer chromosomal and genetic abnormalities may also increase risk for ALL. Children whose mothers had diagnostic X-rays during pregnancy are about one-and-a-half times more likely to have ALL compared with children whose mothers had no X-rays. Risk factors that have been proposed, but not proven, include certain birth characteristics such as high birth weight; medical conditions or drugs affecting delivery; mothers' prior reproductive problems such as repeated miscarriages; pesticides and other chemicals; certain viruses; and natural background ionizing radiation.

13. Are other studies of magnetic fields and childhood leukemia under way? Are studies under way of other risk factors for childhood leukemia?

Population-based studies of residential magnetic fields and childhood leukemia are under way in Canada and the United Kingdom. The results are expected within one to two years.

The NCI/CCG investigators also collected information on use of electrical appliances by mothers during pregnancy and children after birth. The data are still being analyzed, with results expected to be published in 1998. The NCI/CCG magnetic field study was part of a larger CCG study of more than 1,900 children diagnosed with ALL between 1989 and 1993, and 1,900 controls. This ongoing study is designed to evaluate the risk of ALL associated with a wide range of factors, including maternal diseases and medication use during pregnancy, childhood infectious and other diseases, parental occupational exposures, prenatal and postnatal environmental exposures, parental smoking and alcohol use, lifestyle, and genetic factors. Results are expected in about two years.

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For more detailed information on EMF and research on possible health effects, call the National Institute of Environmental Health Sciences' (NIEHS) Environmental Health Clearinghouse at 1-800-NIEHS-94 (1-800-643-4794) to get a copy of the booklet *Questions and Answers About EMF: Electric and Magnetic Fields Associated with the Use of Electric Power*. This publication,

produced by NIEHS and the U.S. Department of Energy, is also available on the World Wide Web at http://www.niehs.nih.gov/oc/factsheets/emf/emf.htm.

Cancer Information from the Office of Cancer Communications
National Cancer Institute news releases are available via the Internet through the World Wide Web (http://rex.nci.nih.gov). Click on Mass Media.

Cancer Information Service
The Cancer Information Service (CIS), a national information and education network, is a free public service of the NCI, the Nation's primary agency for cancer research. The CIS meets the information needs of patients, the public, and health professionals. Specially trained staff provide the latest scientific information in understandable language. CIS staff answer questions in English and Spanish and distribute NCI materials.

Toll-free phone number: 1–800–4–CANCER (1–800–422–6237)
TTY: 1–800–332–8615

CancerFax®
For NCI information by fax, dial (301) 402–5874 from the telephone on a fax machine and listen to recorded instructions.

CancerNet™
For NCI information by computer:

CancerNet Mail Service (via E-mail)
To obtain a contents list, send E-mail to cancernet@icicc.nci.nih.gov with the word "help" in the body of the message.

Internet
CancerNet is also accessible via the Internet through the World Wide Web (http://cancernet.nci.nih.gov) and Gopher (gopher://gopher.nih.gov) servers.

TESTIMONY BEFORE
HOUSE COMMITTEE ON FINANCE

Thomas Jezierny
Vice President of Energy Delivery
Hawaiian Electric Company, Inc.

February 21, 1997

House Bill 2239, H.D.1
Relating to Utility Lines

Chairman Say and Members of the Committee:

Thank you for the opportunity to comment on H.B. No. 2239, H.D.1, Relating to Utility Lines. H.D. 1 is a significant improvement over the original version in that it restores balance in considering whether transmission lines should be constructed overhead or placed underground.

The original version of H.B. 2239 required the PUC to order that all new transmission lines be placed underground unless there was a compelling reason to place it overhead. Such a state policy would add a significant economic burden to Hawaii's consumers. H.D.1 restores balance and allows the PUC to consider a full range of factors when considering whether to approve the proposed configurations and routes for new transmission lines.

I suggest one further amendment to correct a factual error in the bill's findings.

H.B. No. 2239, H.D.1 includes a finding that exposure to electromagnetic fields (EMF) constitutes a "significant, direct adverse effect" of overhead transmission lines (page 1, lines 14-17 and page 2, lines 4-6).

This finding is inaccurate and inconsistent with the conclusions of the State Department of Health, the Federal Environmental Protection Agency and the U.S. National Academy of Sciences.

In 1991, the U.S. Congress directed the National Academy of Sciences to review the existing research literature on the effects of EMF exposure and to determine whether the scientific basis was sufficient to assess health risks from such exposures. The conclusion of the Academy, published in October 1996, was:

> "The current body of evidence does not show that exposure to these fields presents a human-health hazard. Specifically,

> no conclusive and consistent evidence shows that exposure to residential electric and magnetic fields produce cancer, adverse neurobehavioral effects, or reproductive or developmental effects."

It is important that such legislative findings accurately reflect current scientific thought on such complex issues.

Accordingly, we request that lines 4-6 on page 2, be deleted.

Thank you for the opportunity to testify on H.B. No. 2239, H.D.1. With this amendment, we would be pleased to support enactment of this measure.

TESTIMONY BEFORE HOUSE COMMITTEE ON CONSUMER PROTECTION AND COMMERCE

By Thomas J. Jezierny
Vice President of Energy Delivery
Hawaiian Electric Company, Inc.

February 5, 1997

House Bill 2239
Relating to the Public Utilities Commission

Chairman Menor and Members of the Committee:

My name is Tom Jezierny and I am testifying on behalf of the Hawaiian Electric Company and its subsidiaries, Hawaii Electric Light Company and Maui Electric Company.

We oppose H.B. 2239. This Bill would establish "the public policy of placing, constructing, erecting, or building electric transmission systems underground" for the State of Hawaii. Section 1 of H.B. 2239 bases this public policy upon findings by the legislature of various direct and indirect impacts associated with overhead transmission lines.

HRS Section 269-27.6 presently takes a balanced stance in the determination of whether a transmission line should be overhead or underground. It directs the Public Utilities Commission as the expert agency to balance benefits, costs and all other relevant factors in rendering its decision on each transmission line project. H.B. 2239 would shift this balanced standard to a preference for underground transmission lines. HECO firmly believes that an objective review of all factors by the PUC on a project-by-project basis is necessary and will benefit the public at large.

HECOis not opposed to the concept of underground lines. In fact, new subdivisions are today installed with underground distribution and low-voltage electric lines, as well as underground telephone, CATV and street lighting systems. However, because of the high cost of underground transmission lines (46,000 volts and higher), these lines should be installed underground only when it has been determined that the benefits realized are greater than the additional costs involved.

There is no question that underground lines are aesthetically more pleasing than overhead lines. However, the additional cost for the undergrounding of lines would have a negative impact on the residents, businesses and the economic recovery of our State. If we as a state were to start down the path of undergrounding all transmission lines on all islands as a policy, over time, the cost of undergrounding would be very costly. As the Consumer Advocate pointed out in our most recent transmission line project, the cost to install power lines underground to avoid visual impact will increase the cost of electricity by hundred of millions of dollars. Residential rate payers would be required to shoulder this burden when paying their own electric bills or having costs passed through to them in the products or services they buy.

A study conducted in 1993 by the City's Planning Department, which HECO participated in, estimated that it would cost over $13 billion (excluding customer conversion costs) to underground all existing and currently proposed power lines on the island of Oahu. This magnitude of expenditure would have increased a typical residential customer's electric bill by $213 per month. But, this would only be a portion of the increase to residents. Businesses and governments would pay even more of the increase for the cost of undergrounding, because they use much more electricity, and these additional costs would have to be passed on to residents and the public.

As an example of the increase to government, the additional cost for electricity in 1993 to the State of Hawaii would have been $145 million for all of the functions located on Oahu (including the Department of Education and the University of Hawaii). Although one might say that the impact would not be great if we would underground utility lines on a gradual basis, the relative impact of an underground policy would be similar, because $200 today at an escalation rate of 4 percent per year would amount to $400 in 18 years and $800 in 36 years.

In determining the State's policy on underground utility lines, public policy considerations require the need to weigh the additional cost for underground facilities along with the other pressing needs of the State, such as crime, education, transportation, and social welfare. If, after this evaluation, it is determined that the policy is to underground utility lines, then the government entity requiring the undergrounding should bear the additional cost for such undergrounding. This is because, if a branch of government determines that the undergrounding of lines will benefit all of the people, then the taxpayers should pay the cost of undergrounding, not the utilities' customers. The reason for this conclusion is that taxes are progressive (the higher one's taxable income, the higher the taxes) and the cost of electricity is not; it is based on the amount of energy consumed.

A preliminary analysis conducted by the State's Consumer Advocate has shown that lower income customers consume more energy per household than those with higher incomes, because they have more individuals living in a home. Therefore, if the additional cost for the undergrounding of utilities were to be recovered through rates, a greater economic burden would be placed on those families with lower incomes.

For a number of years now, the subject of electric and magnetic fields (EMF) and their possible negative impact on health has been studied and debated throughout the nation and in other countries. In a comprehensive effort, the U.S. Congress in 1991 directed the National Academy of Sciences to review the existing research literature on the effects of EMF exposure and to determine whether the scientific basis was sufficient to assess health risks from such exposures. In response to the directive, the "Committee on the Possible Effects of Electromagnetic Fields on Biologic Systems" was convened. In October 1996, following years of examination of vast amounts of technical data and published scientific reports concerning EMF, the Committee issued a prepublication copy of its report, with final publication slated for February 1997. The conclusion of the Committee is that:

> *"the current body of evidence does not show that exposure to these fields presents a human-health hazard. Specifically, no conclusive and consistent evidence shows that exposures to residential electric and magnetic fields produce cancer, adverse neurobehavioral effects, or reproductive and developmental effects."*

The above is consistent with the positions of the state Department of Health and the Federal Environmental Protection Agency. Accordingly , there clearly is no basis in science or practical reality to require a reduction in the levels of magnetic fields from existing or proposed transmission lines. However, although this most recent report on EMF studies finds no support for a conclusion of adverse health effects caused by EMF exposure, HECO continues to adhere to a prudent avoidance strategy, which is consistent with that of our own State Department of Health and that of other states. The prudent avoidance approach is to design, construct and operate facilities in a manner that will minimize EMF where technically feasible and economically practical.

Similarly, the U.S. Congressional Office of Technology Assessment states the following regarding the approach of prudent avoidance concerning EMF:

> *"Adopt strategies that can limit field exposures with small investments in money and effort. Don't do anything drastic or expensive until research provides a clearer picture of whether there is any risk at all."*

HECO firmly believes this is the right approach in the interest of its customers and the public at large. It would not be prudent nor wise to expend hundreds of millions of dollars to underground transmission lines when there is no conclusive evidence that EMF causes health problems. Available limited financial resources should be spent on addressing known hazardous substances first.

In spite of the high cost of underground transmission lines, there may be situations where underground lines are warranted. Section 269-27.6, Hawaii Revised Statutes, as written, properly directs the Public Utilities Commission to weigh the merits of underground transmission lines on a project-by-project basis and approve the installation of underground lines when justified. We feel it is important to look at situations on a project-by-project basis because relevant factors such as aesthetics, EMF, environment, safety, constructability, operation and maintenance, and cost will vary depending on the location of specific projects.

H.B. 2239 states that the Public Utilities Commission is not given sufficient direction under HRS Section 269-27.6 to determine whether to place a high-voltage electric transmission line underground. However, the existing criteria of Section 269-27.6 mandates the Public Utilities Commission examine all "relevant factors" for each specific transmission line project brought before it. Thus far, the Public Utilities Commission has performed its duties by conducting a detailed and thoughtful public hearing process which considers and analyzes all factors relevant to a particular transmission line project. The proposed amendments to Section 269-27.6, therefore, would only work to unbalance the responsibilities given to the Public Utilities Commission in evaluating the costs and benefits of placing electric transmission systems underground.

In short, H.B. 2239 predisposes our citizens to pay more, unless there is a compelling reason to pay less. We believe it is more appropriate to predispose our citizens to pay less, unless there is a compelling reason to pay more.

In view of the foregoing, we strongly recommend that you hold H.B 2239.

Thank you for allowing me to testify.

Hawaiian Electric Company, Inc. P.O. Box 2750, Honolulu, Hawaii 96840-0001 Code: JA

Transmittal

Date: 9/20/96

Number of pages including cover sheet: 7

To:

Robert W. Fung
Legal Counsel
Public Utilities Commission
State of Hawaii
465 South King Street
Kekuanaoa Building, Rm 103
Honolulu, Hawaii 96813

Phone: 586-2047

Fax phone:

CC: a. Yamamoto

From:

Lance H. Miyahara

Phone: 543-7241 or 543-5608

Fax phone: 543-7023

REMARKS: ☐ Urgent ☒ For your use ☐ Reply ASAP ☐ Please comment

Attached are the results of your 24 hour magnetic field exposure exercise. I have plotted three (3) separate graphs in an effort to demonstrate the broad range of magnetic fields you were exposed to during this exercise.

Graph 1: 0 - 1200 milligauss (mG) Range

Graph 2: 0 - 100 mG Range

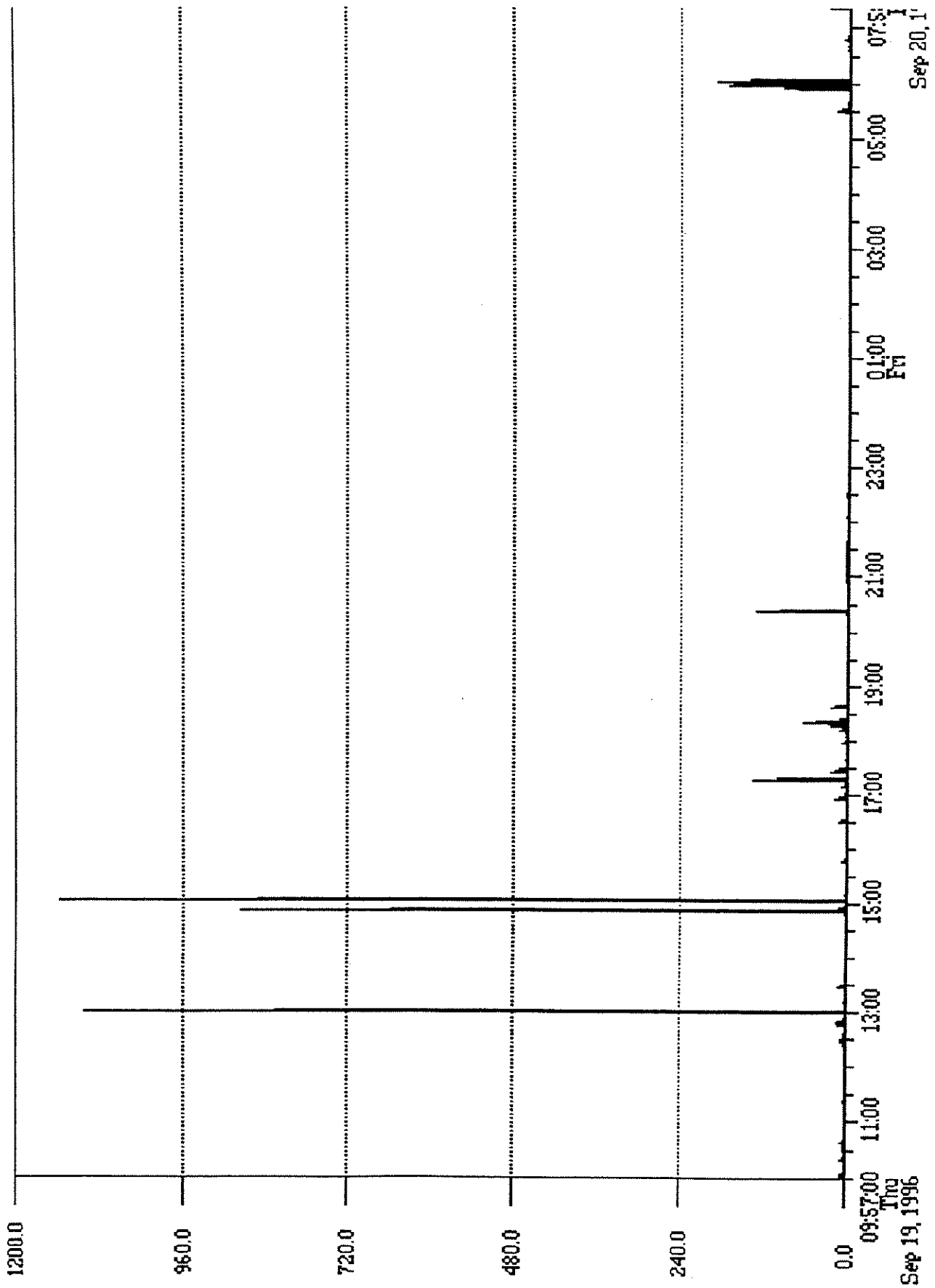
Graph 3: 0 - 30 mG Range

Graphs 2 & 3 were set up to provide better resolution at the lower magnetic field levels. As a result, some of the higher readings were cutting off at the upper limits of the graph. Graph 3 provides a more detailed analysis with respect to time, in other words the time scale was expanded to show greater detail. It may be interesting for you to compare where you were at any given time for example, sitting in your office next to the fan, at home, etc.

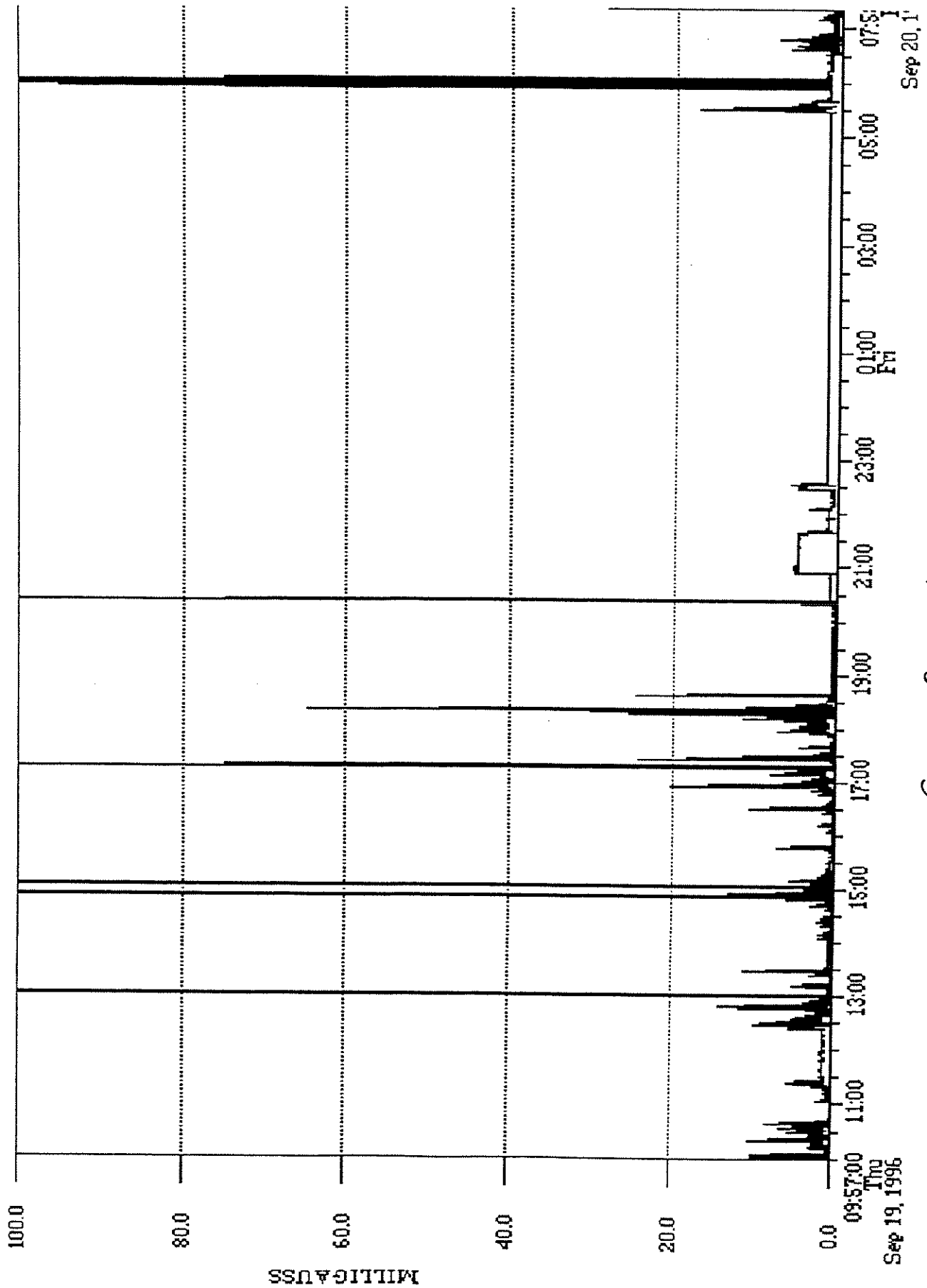
This exercise is intended to demonstrate how we are all exposed to numerous magnetic fields throughout out daily lives. People typically ask whether the higher readings pose any concern. This is difficult to answer because the numerous scientific research to date has not demonstrated that magnetic fields cause adverse health effects. Therefore, there are no established "safe" or "unsafe" exposure limits.

Please let me know if this information is sufficient for your needs or if you require any additional information.

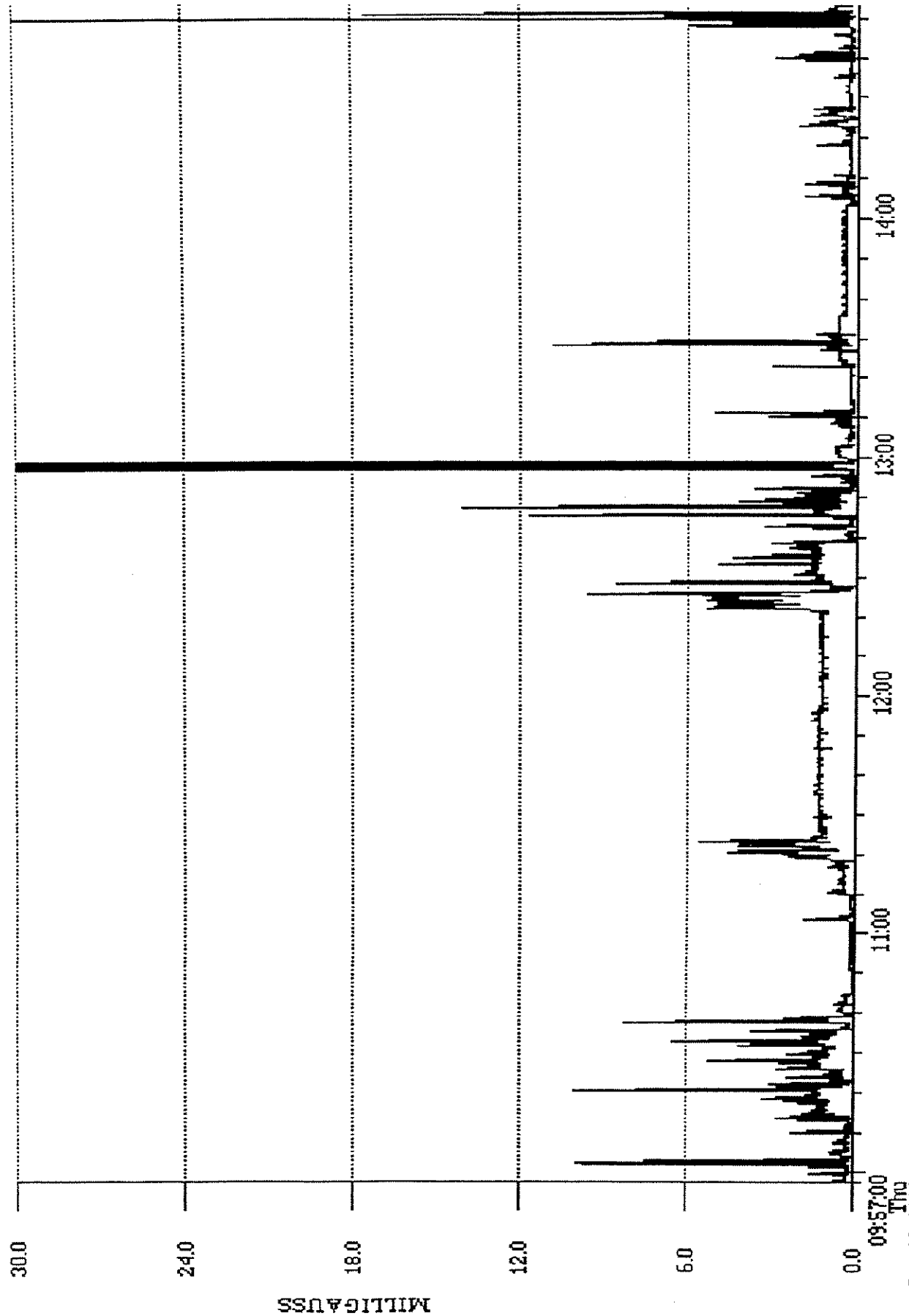
Lance Miyahara



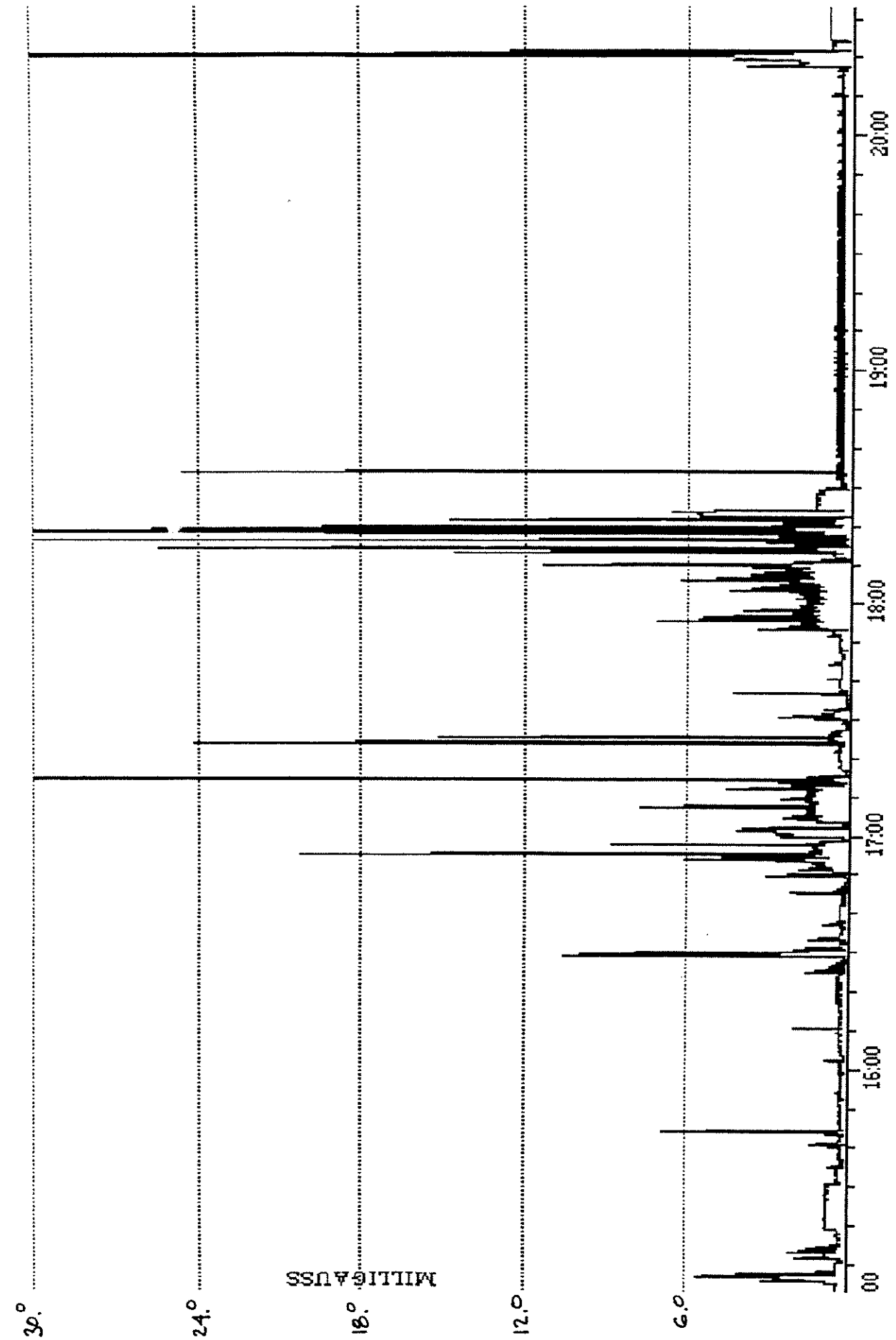
GRAPH 1: 0-1200 mG RANGE



GRAPH 2: 0-100mG



GRAPH 3: 0-30 mG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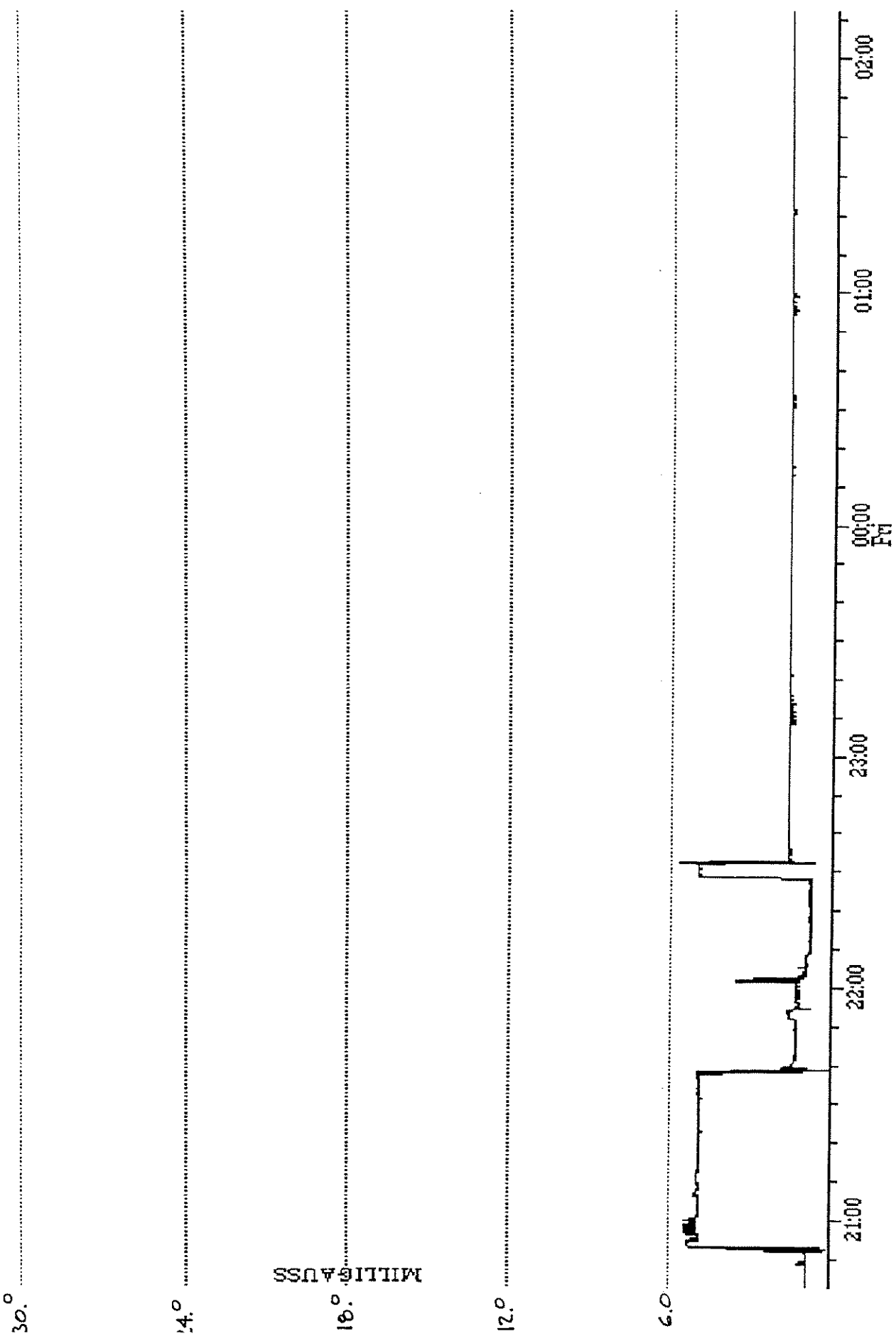
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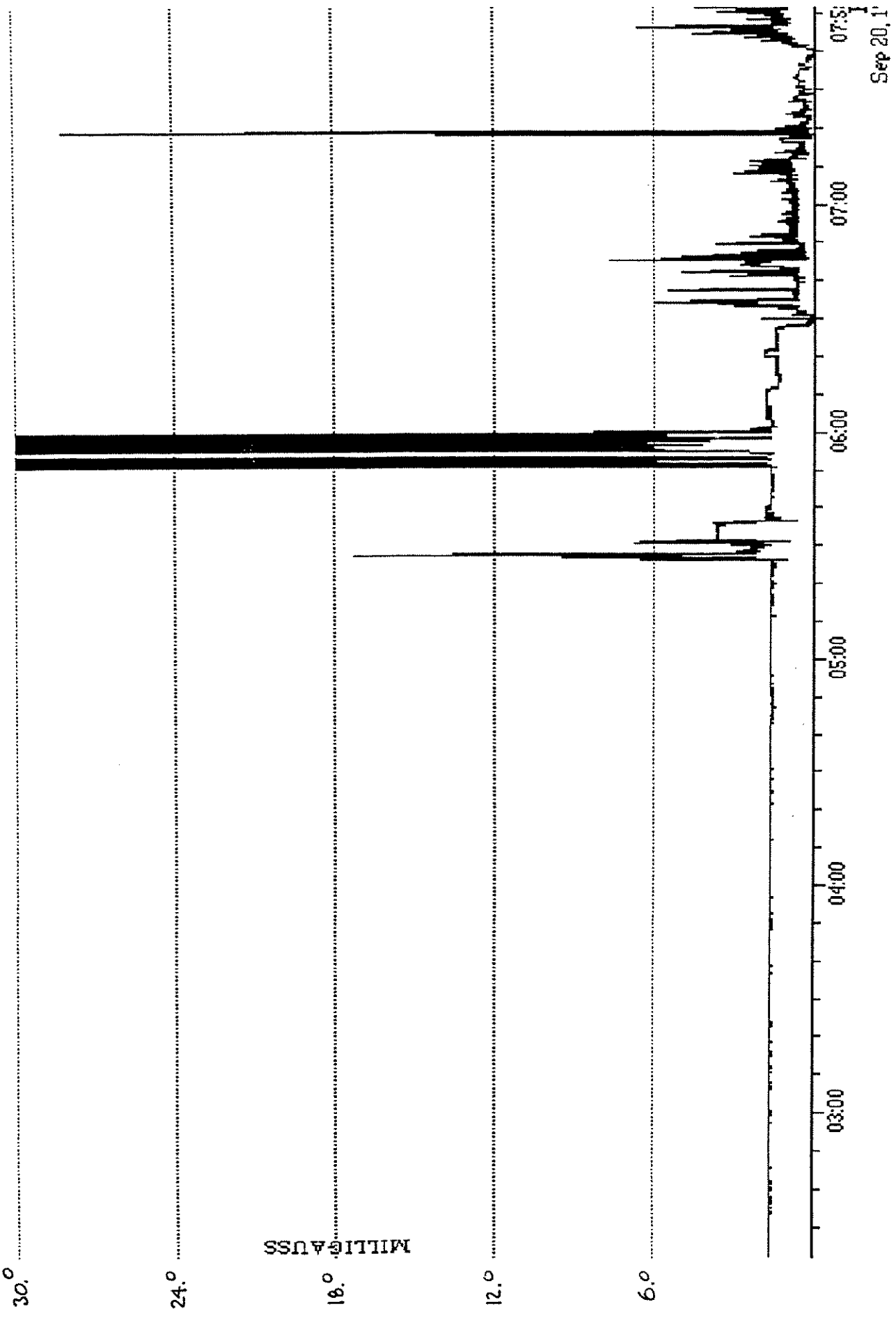
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Hawaiian Electric Company, Inc. • PO Box 2750 • Honolulu, HI 96840-00(

CONSTPR - 6410
BA

August 29, 1996

RECORD COPY

Mr. Herman M. Aizawa, Ph.D.
Superintendent
State of Hawaii
Department of Education
P.O. Box 2360
Honolulu, HI 96804

Dear Mr. Aizawa:

Subject: Salt Lake Boulevard Widening Project

This letter is in response to your concerns regarding possible health risks associated with the transformers and switches required for this project. Please be assured that Hawaiian Electric Company (HECO) considers the health and safety of the general public, our customers, and our employees, as our highest priority. We realize that the subject of Electric and Magnetic Fields (EMF) have been of some concern. HECO has been very proactive in this area and we would like to share some of the information regarding possible health risks from EMF and what the utility industry and health officials in the State of Hawaii are doing to mitigate the public's concerns.

To date, the research on Electric and Magnetic Fields (EMF) and its adverse health effects have been inconsistent and inconclusive. The State Department of Health (DOH) has been reviewing the ongoing research and has determined that there is insufficient evidence to establish EMF as a health risk. Therefore, the DOH advocates a "prudent avoidance" policy based on this determination. This policy defines "prudent avoidance" to mean that reasonable, practical, simple, and relatively inexpensive actions should be considered to reduce exposure. HECO has adopted this prudent avoidance approach and will design new facilities in a manner that will minimize EMF exposure to the public.

The proposed padmounted transformers for the subject project are required within the project limits to service the City's street lights. It has been demonstrated that the EMF level decreases rapidly as the distance from the transformer increases. Consequently, the proposed transformer locations, in the parking areas just inside the road right-of-way, were selected to be away from the normally occupied areas of the school. Additionally, the construction of walls/fences surrounding the transformers will discourage people from coming unnecessarily close to the transformers.

August 29, 1996

The proposed switching vaults included in this project are required to increase the service reliability of the area, including Makalapa Elementary School and Radford High School. The magnetic fields associated with these vaults are generally equal to or lower than those around the transformers, will be protected in a similar manner to the transformers, and will be located as far away from normally occupied areas as possible.

We hope that this letter will alleviate some of your concerns about any health risks associated with HECO's facilities proposed within the public school grounds. Should you have any questions or require additional information, please contact me at 543-4737. Thank you.

Sincerely,

Wendy E. Oda
Senior Land Agent
Land & Rights of Way Division

MH/ERL/FKH

Encs.

Benjamin J. Cayetano
GOVERNOR

HERMAN M. AIZAWA, PH.D.
SUPERINTENDENT
[redacted]

STATE OF HAWAII
DEPARTMENT OF EDUCATION
P. O. BOX 2360
HONOLULU, HAWAII 96804

OFFICE OF THE SUPERINTENDENT

August 5, 1996

Ms. Wendy E. Oda, Senior Land Agent
Land & Rights of Way Division
Hawaiian Electric Company, Inc.
P. O. Box 2750
Honolulu, Hawaii 96840-0001

Dear Ms. Oda:

SUBJECT: Salt Lake Boulevard Widening Project
Request for Transformer Easements
TMK: 9-9-75: 28

We have received your company's request for subject easements at Makalapa Elementary School due to the road widening project. The Department of Education (DOE) has concerns about the proposed location of the transformers on the school campus. The placement of transformers within a 259 square feet easement and 42 square feet easement fronting the school's campus will be unsightly and the electric and magnetic fields associated with the transformers may be a health hazard to the students and staff at the school.

The DOE recommends that the transformers be placed away from the school campus because of possible health risks to our students and staff.

Should there be any questions, please call the Facilities Branch at 733-4862.

Sincerely,

for Herman M. Aizawa, Ph.D.
Superintendent

HMA:hy

cc: A. Suga, OBS
A. Hokama, CDO
D. Uchida, DLNR

HOUSE OF REPRESENTATIVES
THE EIGHTEENTH LEGISLATURE

STATE OF HAWAII
STATE CAPITOL
HONOLULU, HAWAII 96813

Ph: 586-8475
Fax: 586-8479

AUG 1, 1996

Mr. Kerstan Wong
Project Manager
Engineering & Project Management
Hawaiian Electric Company, Inc.
P. O. Box 2750
Honolulu, HI 96840-0001

Dear Mr. Wong:

Thank you for your June 21, 1996 letter enclosing a project status summary for the proposed Kamoku-Pukele 138-kV line. I would greatly appreciate an update on status, especially completion of the draft EIS.

In reviewing my file, I note that I have not received a response to my April 23, 1996 letter to you regarding your Table of Issues Raised During Scoping Period (copy of letter with enclosures attached). I would also appreciate confirmation that the issues and concerns raised in the attachments to that letter were included in a revised table.

Finally, the enclosures to that letter included an April 4, 1996 letter from me to Mark Willey of CH2M Hill regarding issues to be addressed in the EIS process. Could you please confirm to me that all of those issues are in fact being analyzed in preparation of the draft EIS.

Thank you for your further assistance. Please call should you have any questions on my requests. Otherwise, I look forward to your response.

With aloha,

Ed Case

Ed Case
Representative, 23rd District
Manoa/University/Wilder

Enclosures

HOUSE OF REPRESENTATIVES
THE EIGHTEENTH LEGISLATURE

STATE OF HAWAII
STATE CAPITOL
HONOLULU, HAWAII 96813

Ph: 586-8475
Fax: 586-8479

April 23, 1996

Mr. Kerstan Wong
Project Manager
Engineering & Project Management
Hawaiian Electric company, Inc.
P. O. Box 2750
Honolulu, HI 96840-0001

Dear Mr. Wong:

Thank you for your April 12, 1996 letter enclosing a Table of Issues Raised During Scoping Period.

I appreciate your continuing to provide me with information on the status of the Kamoku-Pukele line. However, I did not note in that Table my several comments on various related issues.

Please find enclosed copies of my testimony and correspondence on the proposed project. Please include these concerns in a revised Table so that I may be assured that those issues, which represent both mine and those of many of my constituents, are fully addressed as this process moves forward.

With aloha,

Ed Case

Ed Case
Representative, 23rd District
Manoa/University/Wilder

Enclosure

HOUSE OF REPRESENTATIVES
THE EIGHTEENTH LEGISLATURE
STATE OF HAWAII
STATE CAPITOL
HONOLULU, HAWAII 96813

Ph: 586-8475
Fax: 586-8479

April 4, 1996

Mr. Mark Willey
CH2M Hill
1585 Kapiolani Blvd Suite 1420
Honolulu, Hawaii

Dear Mr. Willey:

Thank you for your February 13th letter in which you responded to some of the concerns I raised in my February 8th letter to HECO.

As you know, one of the alleged detriments of undergrounding is the perception of increased costs in comparison to overheading. One of my concerns has been whether this is in fact true and, if so, to what actual degree, both in general and with respect to the proposed Kamoku-Pukele project.

Accordingly, while I appreciate the installation estimates you provided, I request that the following specific cost and related aspects be both analyzed and evaluated in preparation of the pending EIS, as well as reported in the EIS:

1. A detailed explanation of the calculations involved in your preliminary cost estimates of $12-13 million for an overhead line and $40-50 million for an underground line.

2. The amortized cost over the usable life of underground facilities compared to the amortized cost over the usable life of overhead facilities.

3. The cost of repair arising from exposure of overhead facilities to the elements and natural disasters such as hurricanes.

4. The increase in the average single family electric bill (any potentially applicable ratebase) if the line is placed underground compared to the increase in the average single family electric bill if the line is placed overhead.

5. The willingness of Hawaii electric consumers to pay for undergrounding of transmission lines.

6. The probability and cost of traffic and other accidents relating to exposed overhead transmission facilities.

7. The cost of liability insurance and long-term liability exposure arising from continued overhead line EMF exposure.

8. The cost of the negative impact on public health resulting from longterm exposure to EMF.

9. The cost of the aesthetic degradation of natural resources resulting from overhead facilities.

10. The cost of the negative impact on Hawaii's tourism industry and other industries reliant on Hawaii's natural resources.

11. The cost of any other factor which must or should be evaluated in order to provide a fully accurate economic and social analysis of overheading vs. undergrounding any Kamoku-Pukele lines.

Thank you for your cooperation. Please do not hesitate to call me if you have any questions regarding this matter.

With aloha,

Ed Case

Ed Case
Representative, 23rd District
Manoa/University/Wilder

HOUSE OF REPRESENTATIVES
THE EIGHTEENTH LEGISLATURE

STATE OF HAWAII
STATE CAPITOL
HONOLULU, HAWAII 96813

February 8, 1996

By Fax (543-7898)

Mr. Kerstan Wong
Hawaiian Electric Company, Inc.
P. O. Box 2750
Honolulu, HI 96840-0001

Re: Kamoku-Pukele

Dear Mr. Wong:

In my testimony submitted at the January 22nd public scoping meeting for the proposed Kamoku-Pukele transmission line project (copy attached), I requested clarification on several items. I have not received an answer to date.

It is urgent that I receive a response to my requests immediately. The following reiterate those requests:

1. Please clarify exactly what has and has not been decided thus far about the necessity for, and the exact route of, the proposed line.

2. Please confirm whether HECO has already decided to locate 1.2 miles of the line atop Waahila Ridge through the conservation district and, if so, please summarize the exact legal authority under which that conclusion was reached and the process for public input into that decision which was employed.

3. Please provide the basis and supporting materials for the apparent CH2M Hill conclusion that the proposed

Waahila Ridge pylon line configuration is the most economically reasonable alternative.

4. Please explain whether and, if so, why, full undergrounding of the line is prohibitively uneconomical, as opposed to merely not as economic (if, in fact, it is not) as the other proposed alternatives.

I would also appreciate a concise summary of the status of any pending HECO submissions to the Board of Land and Natural Resources. Please also provide a copy of any pending applications to the BLNR together with all supporting material provided.

Finally, in order to adequately and fully advise my constituents on the precise decisionmaking process and on any and all opportunities for public input, I request a concise summary of exactly what decisions must be made by what government entities and when before HECO may commence construction, if ever, of any Kamoku-Pukele line. In the same context, please summarize specifically all periods and deadlines for public input in connection with any aspect of the decisionmaking process.

With aloha,

Ed Case

Ed Case
Representative, 23rd District
Manoa/University/Wilder

HOUSE OF REPRESENTATIVES
STATE OF HAWAII
STATE CAPITOL
HONOLULU, HAWAII 96813

January 22, 1996

Comments of

Representative Ed Case
23rd District (Manoa/University/Wilder)
House of Representatives
State of Hawaii

on proposed
Kamoku-Pukele 138 KV
Transmission Line Project

Good evening. I am Ed Case, and I represent the 23rd District in the State House of Representatives. I regret that I am unable to appear in person but, as I am recuperating from a broken ankle, have asked Dawn Yoshimura of my staff to represent me.

The 23rd District encompasses virtually all of Manoa Valley down to the H-1 Freeway. It includes the valley walls up to the top, on the Waikiki side, of Waahila Ridge.

At the outset, let me say that there appears to be some confusion as to the exact purpose of this "public scoping meeting." Similarly, there appears to be confusion over exactly what HECO or its consultants have or have not concluded with respect to the proposed Kamoku-Pukele transmission line.

For example, HECO's public notice of this meeting states that the "route and type of transmission line (overhead or underground) for the Kamoku-Pukele Project have not yet been determined." However, CH2M Hill's Draft Environmental Assessment and Environmental Impact Statement Preparation Notice takes for granted that the line will pass through 1.2 miles of conservation district atop Waahila Ridge, and that all that remains to be determined is the "route and alignment configuration for the portion of the line between the Kamoku Substation and where the line will enter the University of Hawaii property above Dole Street . . . ."

CH2M Hill's document further concludes that "[t]hree alternatives to the proposed route have been considered but are not considered viable options." A "lower ridge alternative" was not considered viable because it "would utilize portions of property over which HECO does not already hold easements." An "all underground alternative" through Palolo was similarly dismissed because of "complex engineering", the "constrained nature of the available roadway easements," and "excessively high costs."

I am hopeful that my questions arise solely out of a misunderstanding of the nature and current status of the deliberative process, and so would appreciate, for my constituency, a specific answer to what has and has not been decided thus far. If, in fact, HECO has already decided to locate 1.2 miles of the line atop Waahila Ridge through the conservation district, I request specific confirmation to that effect together with a summary of (1) the legal authority under which that conclusion was reached, and (2) the process for public input into that decision which was employed.

Please let me turn now to the merits of line placement on the assumption that no decisions have been made on placement of any portion of the line. My concerns, which I believe are shared by a majority of residents of my district, are twofold: health, and aesthetics.

To my knowledge, the health hazards of high-voltage airborne electric lines remain unknown; certainly the public perception of risk is still strong. Obviously, my community objects to line placements which enhance any such risks on residents.

On aesthetics, my district is one which prides itself on its natural assets and devotes great attention to preserving and enhancing those resources. This is not just a question of admiring nature's beauty, but also a major contributor to our sense of community.

Our valley walls and ridgelines are an integral part of our resources, and we have vigorously objected to development along those ridges or up those walls. One of the actions of HECO which rankles me still is the decision to relocate an existing electric line up the makai-waikiki valley wall above the new Manoa Estates subdivision, for all to see, rather than simply require the developer to underground that line through the subdivision.

Now we are being told that HECO proposes, or may have already decided, to place a very large transmission line on 100 foot pylons placed atop what appears to be most of the makai half of Waahila Ridge, where now we all enjoy the ridgeline in its natural form. We are being told that that must be done, or should be done, because this is the most economically reasonable alternative, or HECO doesn't want to condemn some more easements, or there are some engineering problems with undergrounding the whole line.

But I thought we were beyond the point where decisions such as line placement were made simply for pure economic reasons. I would also greatly appreciate the opportunity to review the basis for the economic viability conclusions stated so conclusorily by CH2M Hill; is, in fact, undergrounding through Palolo excessive when calculating all maintenance on an amortized basis over the full economic life of the project?

In sum, my community objects very strongly to the placement of this line along the top of Waahila Ridge. Obviously, we favor full undergrounding. If that is truly not practical for reasons other than purely prohibitive economics (and we would appreciate a full explanation of why those economics are actually prohibitive), then we seek a route which sets the line down and back from view.

Thank you for this opportunity to comment. I look forward to HECO's reply to the specific inquiries raised, and stand ready to work constructively for a solution which is satisfactory to my community and others.

Hawaiian Electric Company, Inc. • PO Box 2750 • Honolulu, HI 96840-0001

May 23, 1996

Ms. Joan Harper
Office of Council Services
City & County of Honolulu
530 So. King Street
Honolulu, Hawaii 96813

Subject: Kamoku-Pukele 138kV Transmission Line Project

Dear Ms. Harper:

Thank you for your telephone inquiry on Hawaiian Electric Company's Kamoku-Pukele 138kV Transmission Line Project.

Currently, we are preparing the Environmental Impact Statement (EIS) for the project.

Please find enclosed the following documents related to the EIS:

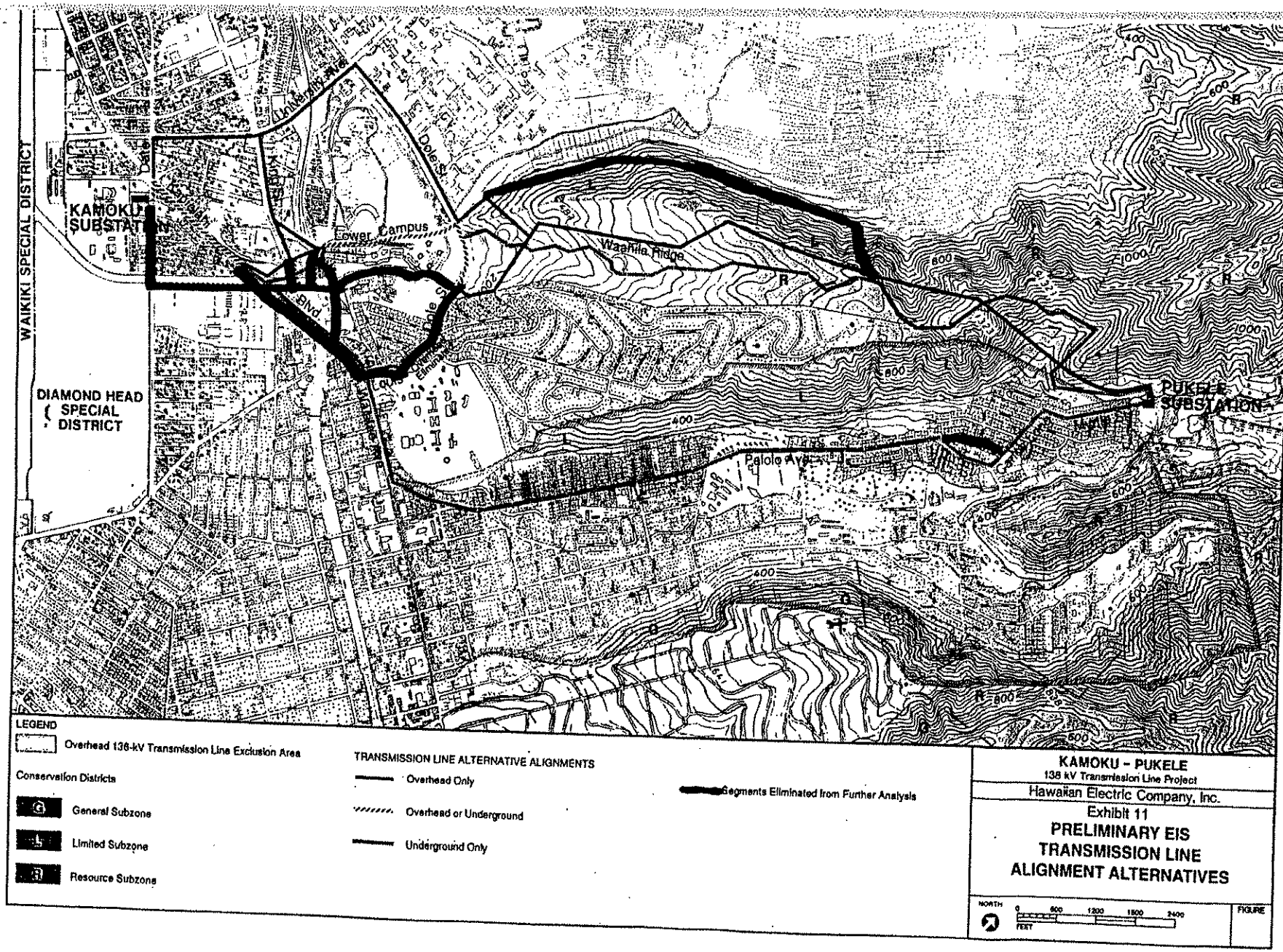
- "Preliminary EIS Transmission Line Alignment Alternatives"
- "How Items will be Covered in the EIS"

In the Alignment Alternatives diagram, the segments highlighted in "red" are no longer under consideration as potential transmission line alignments. The remaining alignments will be studied in detail and the results of the analysis will be presented in the draft EIS. The draft EIS will be issued for public comment later this year and a Public Hearing will held to receive oral testimony.

If you have any questions on the enclosed information, please call me at 543-7059.

Sincerely,

Kerstan J. Wong
Project Manager
Engineering & Project Management


WAIKIKI SPECIAL DISTRICT
DIAMOND HEAD SPECIAL DISTRICT
KAMOKU SUBSTATION
PUKELE SUBSTATION
Lower Campus
Waahila Ridge
Palolo Ave
University Ave
Dole St
Kapiolani Blvd
LEGEND
Overhead 138-kV Transmission Line Exclusion Area
Conservation Districts
General Subzone
Limited Subzone
Resource Subzone
TRANSMISSION LINE ALTERNATIVE ALIGNMENTS
Overhead Only
Overhead or Underground
Underground Only
Segments Eliminated from Further Analysis
KAMOKU – PUKELE
138 kV Transmission Line Project
Hawaiian Electric Company, Inc.
Exhibit 11
PRELIMINARY EIS
TRANSMISSION LINE
ALIGNMENT ALTERNATIVES
NORTH
0 600 1200 1800 2400
FEET
FIGURE

EIS Public Scoping Comments
Proposed Kamoku - Pukele 138-kV Transmission Line Project

How Items will be Covered in the EIS

The following concerns with the proposed Kamoku to Pukele 138-kV Transmission Line Project were raised through letters and comments received during the Public Scoping Period. They will be addressed as follows within the environmental impact statement:

- **Conservation District Concerns**

  A full discussion of the project's relationship to the purpose and objectives of the Conservation District Subzones and how the proposed project meets the criteria listed in Section 13-5-30 (c) of the existing Conservation District rules will be included in the EIS. In addition, the relationship of the proposed project to other federal, state, and county land use plans, policies, and controls will be discussed.

- **Construction Impacts**

  Impacts from construction methods for both overhead and underground transmission lines will be evaluated. Construction within the Conservation District is anticipated to require the use of helicopters and may require the temporary disruption of portions of the existing hiking trails along Waahila Ridge. Construction within the Urban District is anticipated to require the disruption of traffic flows along one to two lanes of traffic. Construction efforts will be coordinated with the various agencies concerned, such as the Department of Health (noise, fugitive dust, etc.), Department of Transportation Services (work in roadways), Department of Public Works (City utilities) and the Department of Land and Natural Resources, State Parks Division (work within Waahila Ridge State Recreation Area). Construction mitigation plans will be prepared as required to address traffic and erosion concerns.

- **Costs of the Project**

  Economic information and costs of the various alternatives will be presented in the EIS. The project will be assessed in relationship to HECO's long-range improvement plans. Cost data will include construction, operations, and maintenance costs. HECO will attempt to assess the impact of overall project costs on individual rate-payers.

- **Cultural/Historic Resources**

  Paul H. Rosendahl, Inc. will be retained to conduct an archaeological inventory of the project area and to assess the potential impacts of the various alternatives on archaeological and cultural resources. Their report and any recommended mitigation measures will be included in the EIS and forwarded to the State of Hawaii Historic Preservation Office for their consideration.

- **Electric and Magnetic Fields**

  EMF modeling will be performed and the results documented within the EIS for both overhead and underground alternatives and for the Pukele and Kamoku Substations. Existing and projected EMF data will be presented to the public through the EIS. Efforts taken to mitigate exposure to EMF also will be described. An exposure assessment survey will be conducted within the study area to characterize general EMF exposure during daily activities. This report will also be included in the EIS discussion. In addition to electric and magnetic fields, the EIS will include analyses of potential electrical interference, corona effects, and audible noise.

- **Potential Health Effects of EMF**

  The status of research on the potential health effects from EMF will be described in the EIS. The EIS will include a synopsis and discussion of EMF studies conducted to date.

- **Environmental Concerns**

  The potential impact of the various alignments on environmental resources will be assessed through the EIS process. These resources will include: flora, fauna, surface and groundwater, air quality, and soils. In addition, archaeological, socioeconomic, and land use resources will be examined. Other topics which will be included in the EIS include potential impacts on visual resources, infrastructure, property values, traffic, and local land uses. Specialized subconsultants will be retained to survey the project area for candidate or listed threatened or endangered floral or faunal species, and to locate sensitive archeological resources. In addition, geophysical surveys will be conducted to characterize the soil resources of the area to better assess potential impacts on soil slippage, sediment loading in streams, and potential changes in runoff patterns. All subconsultant reports will be included in the EIS.

- **Environmental Justice**

  The EIS will include a discussion of the socioeconomic makeup of the various neighborhoods along the proposed alternative alignments.

- **Land Use and Other Plans**

  The relationship of the proposed project with various federal, state, and county land use plans, guidelines, and policies will be assessed and included in the EIS. In addition, the relationship of the proposed project to the University of Hawaii's Long Range Development Plan will be assessed.

- **Natural Hazard and Public Safety Concerns**

  The Hawaii building code for structures and high rises specify a design wind speed of 80 miles per hour plus additional safety factors. The steel transmission poles and associated lines for this project will be designed for wind speeds of 100 mph.

- **General Project Concerns**

  A full discussion of the need for the project will be included in the EIS. The discussion will relate the need for the project to both the local service area and the islandwide transmission system. The EIS will also include a description of the various alternatives considered to the proposed project. The alternatives to be discussed include the no-build alternative, the deferred-build alternative, use of demand-side management, use of alternative generation sources, use of alternative transmission/distribution system sources, and the various "build" alternatives, which include an overhead line over various routes and two different underground technologies over various routes. Between 1993 and 1995, an Alternatives Study was conducted by CH2M HILL, HECO, and the Community Advisory Committee. This Study examined various alternatives to the proposed transmission line and evaluated the reports which determined the overall need for the project. This study will be included in the EIS.

- **Property Values**

  The potential impact of the proposed transmission line on property values will be examined in the EIS by the subconsultant John Child & Company. Impacts will be based on a comparison of market data, interviews with real estate professionals, and research and review of published articles relating to electric transmission lines and EMF impacts on land values. The subconsultant's full report will be included in the EIS.

- **Public Process**

  A description of the public participation process will be included in the EIS. In 1993, HECO formed a Citizen's Advisory Committee to assist them in formulating alternatives and to provide information on public concerns. The CAC has been actively involved in the project since its formation. In addition, two separate rounds of scoping processes have been conducted for the proposed project, one in 1993 and one in 1996. Three public meetings have also been held since 1993 to solicit project comments. All comments received during these meetings as well as from scoping letters and other meetings held between HECO and the public will be incorporated into the EIS.

- **Pukele and Kamoku Substation Concerns**

  Impacts of the Pukele and Kamoku Substation modifications will be assessed in the EIS. These impacts will include, but will not be limited to, noise, EMF, and potential radio/TV interference.

- **Recreational Concerns**

  Construction within the Waahila Ridge State Recreation Area does have the potential to cause temporary disruption to portions of the various hiking trails along the ridge. Pole locations will be identified and construction activities will be coordinated with the appropriate state agencies to ensure adequate safety and access to the recreational opportunities within the recreation area.

- **Traffic Concerns**

  Construction of either an overhead or underground transmission line will cause temporary traffic disruptions to one or two lanes along affected roadways. HECO will prepare the appropriate traffic mitigation construction plans and submit those to the Department of Transportation Services. Access requirements for businesses and residences along the roadways will also be addressed within any construction-related traffic plan. As a way of mitigating impacts, work is generally not performed within the roadways during the peak hours of traffic operations.

- **Visual Impacts**

  Visual aesthetics will be assessed through a series of photographic and computer simulations. These simulations will be presented to the public in the EIS. Sensitive viewpoints will be determined with the help of the Community Advisory Committee and the Department of Land and Natural Resources.

Hawaiian Electric Company, Inc. P.O. Box 2750, Honolulu, Hawaii 96840-0001 Code: JA

Transmittal

Date: 4/15/96

Number of pages including cover sheet: 18

To:

Ms. Shari Kimura
Research Assistant to
Councilmember Duke Bainum
530 South King Street, Rm. 202
Honolulu, HI 96813

Phone: 527-5683
Fax phone: 523-4220
CC: Kerstan Wong

From:

Lance Miyahara

Phone: 543-7241 or 543-5608
Fax phone: 543-7023

REMARKS: ☐ Urgent ☒ As requested ☐ Reply ASAP ☐ Please comment

Hawaiian Electric was aware of the unauthorized release of the National Council on Radiation Protection (NCRP) draft report, referenced at the January 22, 1996, public information meeting. The draft report is an early working copy that was not sanctioned by the 75 member Council prior to its release. Responding to the unauthorized publication of a draft EMF report, Charles Meinhold, President, of the NCRP stated, "... As the draft in question is still undergoing revisions to prepare it for entry into the initial review phase, it exists only as a working draft which should not have been released outside Scientific Committee 89-3. Thus, it should not be copied, quoted, cited, or referenced outside of the NCRP. The current draft material has absolutely no standing at this time."

HECO is complying with the request of the NCRP by regarding the draft report as a preliminary document. The draft recommendations have yet to undergo stringent review by the members of the NCRP and others of the scientific community. HECO understands that critical and extensive scientific review by experts in the field and other members of the scientific community is essential. Often, reports and studies that have not undergone critical scientific review are picked up by the media and the general public, resulting in confusion and misinformation. HECO will continue to monitor the NCRP review process and the development of its final report.

The following articles are being provided as requested on the April 4, 1996 Town Meeting in Palolo:

1. "NCRP Draft Recommendations on EMF Exposure Guidelines," Microwave News, July/August 1995, pp. 12-15
2. "Draft NCRP Report Seeks Strong Action To Curb EMFs," Microwave News, July/August 1995, pp. 1 & 11
3. "Leak links power lines to cancer," New Scientist, October, 7, 1995, pg. 4
4. "NCRP President Disavows Draft EMF Document," EMF News, September 11, 1995, pp. 1 & 4
5. "NCRP SC 89-3 Draft Leaked," EMF Health & Safety Digest, September 1995, pp. 15 - 17
6. "NCRP Responds to Concerns Over Microwave News Article," EPRINET News Service, 8/22/95
7. "EPA Shelves EMF - Cancer Report," Microwave News, January/February 1996, pp. 1 & 7

Hawaiian Electric Co., Inc. An HEI Company

FAX COVER SHEET

To: Shari Kimura
Company: Councilmember Duke Bainum's Office
Phone: 527-5683
Fax: 523-4220

From: Kerstan Wong
Company: HECO - Engineering & Project Managment
Phone: 543-7059
Fax: 543-7898

Date: January 31, 1996
Pages including this cover page: 3

Comments:

Shari,

Please find attached, HECO's position on the unauthorized release of the NCRP draft report and some supporting information.

As you may recall, this draft report was discussed at the Kamoku-Pukele Community Advisory Committee's November 1995 meeting.

If you have any questions regarding the attached information, please call me at 543-7059 or Lance Miyahara at 543-7241,

Thanks,
Kerstan

cc: P. Nakagawa
L. Miyahara

Hawaiian Electric was aware of the unauthorized release of the National Council on Radiation Protection (NCRP) draft report, referenced at the January 22, 1996, public information meeting. The draft report is an early working copy that was not sanctioned by the 75 member Council prior to its release. The July/August 1995 issue of Microwave News quotes NCRP President, Charles Meinhold as saying, "As the draft in question is still undergoing revisions to prepare it for entry into the initial review phase, it exists only as a working draft which should not have been released outside Scientific Committee 89-3. Thus, it should not be copied, quoted, cited, or referenced outside of the NCRP. The current draft material has absolutely no standing at this time."

HECO is complying with the request of the NCRP by regarding the draft only as a preliminary document of recommendations that must be reviewed by Council and others of the scientific community. HECO understands that critical and extensive scientific review by experts in the field and other members of the scientific community is essential. Often, reports and studies that have not undergone critical scientific review are picked up by the media and the general public, resulting in confusion and misinformation. HECO will continue to monitor the NCRP review process and the development of its final report.

The following is an EPRINET News Service article clarifying the NCRP's current position:

Title: **NCRP Responds to Concerns Over Microwave News Article** 08/22/95

Responding to the **unauthorized publication** last week of part of a draft EMF report, Charles Meinhold, President, National Council on Radiation Protection and Measurements (NCRP), Bethesda, Md., stated today in an open letter [reproduced here in its entirety]:

> Draft material formulated in connection with the work of The National Council on Radiation Protection and Measurements' (NCRP) Scientific Committee 89-3 on Extremely Low Frequency Electric and Magnetic Fields has been disseminated outside of the Committee membership and portions have been published and widely **distributed without the authorization of the NCRP**. The availability of this draft material makes it necessary to make evident the Council's procedures for producing NCRP recommendations, procedures that, over the NCRP's more than 60 years of service to the public interest, have proved effective in producing a consensus of the leading scientific thinking on matters of radiation protection and measurement. At the point that an NCRP scientific committee completes what it considers to be its final [emphasis added] draft, the draft enters the extensive review process employed by the NCRP. This process generally follows the following scenario: (1) General peer review by several selected reviewers who are considered to be experts in the field of the report, (2) revision of the report based on the comments received, (3) review of the revised draft by the 75 volunteer NCRP Council members as well as approximately 50 Collaborating and Special Liaison Organizations involved in the council's program, (4) further revision of the report to address the comments proffered-keeping in mind that the 75 Council members must be virtually

unanimous in the approval of the draft before a report can be issued, and finally, (5) preparation of the draft for printing as an NCRP report.

As the draft in question is still undergoing revisions to prepare it for entry into the initial review phase, it exists only as a working draft which should not have been released outside Scientific Committee 89-3. Thus, it should not be copied, quoted, cited, or referenced outside of the NCRP. The current draft material has absolutely no standing at this time. Furthermore, since all of the reviewers and NCRP council members serve as volunteers, and considering the extensive nature of the review process, it is impossible to predict when the NCRP may have a report on the subject of extremely low frequency electric and magnetic fields.

One of the primary objectives set forth in the Congressional Charter of the NCRP is to collect, analyze, and disseminate information and recommendations about radiation protection and measurements. **The unauthorized distribution of the current preliminary draft material is unfortunate and not the sanctioned means of disseminating information. It is hoped that interested parties will ignore this material and allow the NCRP process to proceed so that a report endorsed by the NCRP can be obtained.**

Meinhold's statement was made as concerns rose surrounding the publication of an article by "Microwave News" in its July/August 1995 issue, published last week. The cover story reported extensively on the status of NCRP's Scientific Committee 89-3 EMF draft report. The newsletter also reproduced an entire chapter containing the subcommittee's June 13, 1995 draft recommendations on public and occupational exposure guidelines.

Dr. Thomas Tenforde, chair of NCRP's Non Ionizing Committee, that oversees the activities of SC 89-3, and Dr. Ross Adey, SC 89-3 chair, also received copies of the letter.

NCRP is a not-for-profit corporation chartered by the U.S. Congress in 1964. Its purpose is to analyze and disseminate information regarding ionizing radiation protection and measurements. The information is disseminated through authoritative reports available to the public for sale.

In 1984, the U.S. Environmental Protection Agency requested that NCRP investigate the EMF health effects issue. SC 89-3 was then established.

REPORTED BY: CGLynch, EMF Information Project
612/623-4600 (FAX-3645) ; EPRINET ID: UA4I910

Hawaiian Electric Company, Inc. • PO Box 2750 • Honolulu, HI 96840-000

October 24, 1995

Mr. Eric Sakanashi
Housing Finance and Development Corporation
State of Hawaii
677 Queen Street, Suite 300
Honolulu, Hawaii 96813

Subject: EMF Information on Kewalo Substation

Dear Eric:

As requested in your September 6, 1995 letter, we are providing you with EMF Information on Kewalo Substation. Please find enclosed, the "Kewalo Substation Magnetic Fields Study" which analyzes the existing and projected magnetic field levels at the substation.

If you have any questions on the enclosed material, please feel free to call me at 543-7059.

Sincerely,

Kerstan J. Wong
Project Manager
Engineering & Project Management

KJW
enclosure

cc: E. Oshiro
L. Miyahara

BENJAMIN J. CAYETANO
GOVERNOR

ROY S. OSHIRO
ACTING EXECUTIVE DIRECTOR

STATE OF HAWAII
DEPARTMENT OF BUDGET AND FINANCE
HOUSING FINANCE AND DEVELOPMENT CORPORATION
677 QUEEN STREET, SUITE 300
HONOLULU, HAWAII 96813
FAX (808) 587-0600

IN REPLY REFER TO
95:DSS/5166

September 6, 1995

Mr. Kerstan J. Wong
Hawaiian Electric Company, Inc.
P.O. Box 2750
Honolulu, Hawaii 96840-0001

Dear Mr. Wong:

Subject: EMF Information

We would like to thank you for meeting with us in regards to the future plans of HECo's Kewalo Substation. As we discussed during the meeting, the Housing Finance and Development Corporation is currently investigating the feasibility of developing a residential complex on an adjacent property. Although we were able to address the concerns on aesthetics and noise, we have not been able to get information on the intensity of EMF surrounding substations. We understand that research on EMF and its affect on health have been inconclusive, but the State Department of Health recommends practicing "prudent avoidance."

As you suggested, we contacted HECo's Education and Consumer Affairs Department to request an EMF survey at the property line of the Kewalo Substation. Unfortunately, they could not accommodate us because they only provide the EMF service to individual residential customers.

To determine the EMF impact that the Kewalo Substation may have on the adjacent property, we request your assistance in obtaining data on the intensity of the EMF. Knowing the exact distance that the EMF reduce to zero will be very useful in our layout of the proposed complex.

Once again, we appreciate your assistance and if you have any questions, please call me at 587-0560.

Sincerely,

ERIC F. SAKANASHI
Engineer

c: Stanley Fujimoto

Hawaiian Electric Company, Inc. • PO Box 2750 • Honolulu, HI 96840-0001

September 6, 1994

Mr. Cliff Terry
Chairperson
Palolo Neighborhood Board No. 6
c/o Neighborhood Commission
City Hall, Room 400
Honolulu, Hawaii 96813

Subject: Palolo Neighborhood Board No. 6
Minutes of Regular Meeting
July 27, 1994

Dear Mr. Terry:

I would like to clarify a matter that appeared in the July 27, 1994 meeting minutes of the Palolo Neighborhood Board No. 6. On Page 5 of the minutes, regarding Hawaiian Electric Company's Kamoku-Pukele Community Advisory Committee, the following statement was made: "Use of more, smaller capacity power lines, instead of one larger capacity line, would reduce the intensity of electro magnetic fields."

To begin, I would like to address the subject of electromagnetic fields in general. For power lines, electromagnetic energy is made up of electric and magnetic fields. An electric field is directly related to voltage. In other words, the higher the voltage of a power line, the greater the strength of the electric field. Similarly, a magnetic field (the subject of recent health-related concerns) is directly related to current flowing in the conductors of a power line.

The "intensity" or field strength of a magnetic field from a power line is usually measured or calculated from a reference point located at some distance away from the line. Some of the main factors that determine the strength of the magnetic field are: 1) the magnitude of the current (the smaller the current, the lower the strength); 2) the distance of the conductors from the reference point (the farther away, the lower the strength); 3) the configuration and physical distance between the conductors of the power line (the closer together, the greater the field "cancellation" effect) and; 4) the presence of other electrical circuits (fields from a second line may "cancel" some of the fields of the first line). A proper analysis of magnetic field strength is rather complex and must at a minimum, take these factors into account.

Therefore, the concept of using "more, smaller capacity power lines instead of one larger capacity line" to reduce the intensity of magnetic fields is not necessarily true. In actuality, multiple lines could expose more residents to magnetic fields than a single "large" line since more streets will be used for line routes.

Thank you for the opportunity to clarify this matter. If you have any questions, please do not hesitate to call me at 543-7059.

Sincerely,

Kerstan J. Wong
Project Manager
Facilities & Project Management

KJW:kjw

Hawaiian Electric Company, Inc. • PO Box 2750 • Honolulu, HI 96840-00

William A. Bonnet
Manager
Environmental Department

April 4, 1994

Dr. Bruce Anderson
Deputy Director
Hawaii State Department of Health
Environmental Health Division
P. O. Box 3378
Honolulu, Hawaii 96801

Dear Dr. Anderson:

For your information, I am enclosing a copy of the most recent occupational study of EMF. Sometimes referred to as the Canadian-French study, it does not provide any revelations. Although there are some statistically significant associations, there is no evidence of a dose-response relationship, and the findings are inconsistent among the three utilities studied. I have also forwarded a copy to Leslie Au.

Sincerely,

Enclosure

cc: L. Au w/enclosure

Hawaiian Electric Company, Inc. • PO Box 2750 • Honolulu, HI 96840-00

March 10, 1994

Mr. Robert B. Lee
Central Oahu District Superintendent
300 Kahelu Avenue, Suite 50
Mililani, Hawaii 96789

Dear Mr. Lee:

In October and November of this school year, Hawaiian Electric Company's EMF Education Project workshops were held for high school science teachers. We realize that attendance at these workshops may have been difficult due to the many demands made of teachers and the fact that the workshops were held from 3:00 p.m. to 5:00 p.m.

Therefore, in response to teacher requests, a Saturday session for Oahu high school science teachers has been scheduled for:

DATE:	Saturday, April 30, 1994
PLACE:	Honolulu Club Training Room #1 (Located between TGIFriday and the parking entrance to the Honolulu Club. Parking is available at the Neal Blaisdell Center for $3.00.)
TIME:	8:30 - 11:30 a.m.

All teachers attending this session will receive a personal copy of the ***Electric and Magnetic Fields: Investigating and Evaluating an Issue*** Teacher's Resource Guide. Magnetic field meters will be given to the principal's designee of schools which have not participated in the earlier workshops. For workshop participants who are from schools which have already received their magnetic field meter (See Attachment A), extra meters will be available for their use during the workshop session.

Hawaiian Electric Company sincerely appreciates your district's support of this project. As for informing your high schools, we did not want to increase the workload of your district staff, therefore, letters to inform high school principals of this workshop and registration forms are being sent directly to the schools. We invite you and any of your district staff to attend this informative session. A registration form is attached.

If you have any questions, please do not hesitate to call me at 543-7741 or Kathy Kawaguchi at 543-7368.

Sincerely,

Charlotte T. Kawazoe, Director
Education and Consumer Affairs Division
Energy Services Department

Attachments

cc: Harriet Ajimine, OIS
Justin Mew, OIS
Richard O'Connell
Jay Mulki
William Bonnet
David Waller
Kathy Kawaguchi

Hawaiian Electric Company, Inc. • PO Box 2750 • Honolulu, HI 96840-0001

March 10, 1994

Ms. Ernesta H. Masagatani
Honolulu District Superintendent
4967 Kilauea Avenue
Honolulu, Hawaii 96816

Dear Ms. Masagatani:

In October and November of this school year, Hawaiian Electric Company's EMF Education Project workshops were held for high school science teachers. We realize that attendance at these workshops may have been difficult due to the many demands made of teachers and the fact that the workshops were held from 3:00 p.m. to 5:00 p.m.

Therefore, in response to teacher requests, a Saturday session for Oahu high school science teachers has been scheduled for:

DATE:	Saturday, April 30, 1994
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If you have any questions, please do not hesitate to call me at 543-7741 or Kathy Kawaguchi at 543-7368.

Sincerely,

Charlotte T. Kawazoe, Director
Education and Consumer Affairs Division
Energy Services Department

Attachments

cc: Harriet Ajimine, OIS
Justin Mew, OIS
Richard O'Connell
Jay Mulki
William Bonnet
David Waller
Kathy Kawaguchi

Hawaiian Electric Company, Inc. • PO Box 2750 • Honolulu, HI 96840-0001

March 10, 1994

Mr. Liberato C. Viduya, Jr.
Leeward District Superintendent
94-299 Farrington Highway
Waipahu, Hawaii 96797

Dear Mr. Viduya:

In October and November of this school year, Hawaiian Electric Company's EMF Education Project workshops were held for high school science teachers. We realize that attendance at these workshops may have been difficult due to the many demands made of teachers and the fact that the workshops were held from 3:00 p.m. to 5:00 p.m.

Therefore, in response to teacher requests, a Saturday session for Oahu high school science teachers has been scheduled for:

DATE:	Saturday, April 30, 1994
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Hawaiian Electric Company sincerely appreciates your district's support of this project. As for informing your high schools, we did not want to increase the workload of your district staff, therefore, letters to inform high school principals of this workshop and registration forms are being sent directly to the schools. We invite you and any of your district staff to attend this informative session. A registration form is attached.

If you have any questions, please do not hesitate to call me at 543-7741 or Kathy Kawaguchi at 543-7368.

Sincerely,

Charlotte T. Kawazoe, Director
Education and Consumer Affairs Division
Energy Services Department

Attachments

cc: Harriet Ajimine, OIS
Justin Mew, OIS
Richard O'Connell
Jay Mulki
William Bonnet
David Waller
Kathy Kawaguchi

Hawaiian Electric Company, Inc. • PO Box 2750 • Honolulu, HI 96840-0001

March 10, 1994

Mr. John P. Sosa
Windward Oahu District Superintendent
46-169 Kamehameha Highway
Kaneohe, Hawaii 96744

Dear Mr. Sosa:

In October and November of this school year, Hawaiian Electric Company's EMF Education Project workshops were held for high school science teachers. We realize that attendance at these workshops may have been difficult due to the many demands made of teachers and the fact that the workshops were held from 3:00 p.m. to 5:00 p.m.

Therefore, in response to teacher requests, a Saturday session for Oahu high school science teachers has been scheduled for:

DATE:	Saturday, April 30, 1994
PLACE:	Honolulu Club Training Room #1 (Located between TGIFriday and the parking entrance to the Honolulu Club. Parking is available at the Neal Blaisdell Center for $3.00.)
TIME:	8:30 - 11:30 a.m.

All teachers attending this session will receive a personal copy of the ***Electric and Magnetic Fields: Investigating and Evaluating an Issue*** Teacher's Resource Guide. Magnetic field meters will be given to the principal's designee of schools which have not participated in the earlier workshops. For workshop participants who are from schools which have already received their magnetic field meter (See Attachment A), extra meters will be available for their use during the workshop session.

Hawaiian Electric Company sincerely appreciates your district's support of this project. As for informing your high schools, we did not want to increase the workload of your district staff, therefore, letters to inform high school principals of this workshop and registration forms are being sent directly to the schools. We invite you and any of your district staff to attend this informative session. A registration form is attached.

If you have any questions, please do not hesitate to call me at 543-7741 or Kathy Kawaguchi at 543-7368.

Sincerely,

Charlotte T. Kawazoe, Director
Education and Consumer Affairs Division
Energy Services Department

Attachments

cc: Harriet Ajimine, OIS
Justin Mew, OIS
Richard O'Connell
Jay Mulki
William Bonnet
David Waller
Kathy Kawaguchi

Attachment A

SCHOOLS WHICH HAVE RECEIVED THEIR MAGNETIC FIELD METERS
and
NUMBER OF WORKSHOP PARTICIPANTS

DISTRICT/SCHOOLS	NO. of WORKSHOP PARTICIPANTS
Central District:	
Public:	
• Aiea High School	2
• Leilehua High School	1
• Mililani High School	2
• Moanalua High School	1
• Radford High School	2
• Waialua High School	1
Private:	
• Hanalani	1
Honolulu District:	
Public:	
• Farrington High School	3
• Kalani High School	1
• McKinley High School	5
• Roosevelt High School	1
Private:	
• Hawaiian Mission Academy	1
• Iolani School	1
• Kamehameha Schools	1
• La Pietra Hawaii School for Girls	1
• Maryknoll High School	1
• Sacred Hearts Academy	1
• St. Andrew's Priory School	2
• St. Francis High School	2
• St. Louis School	2
Leeward District:	
Public:	
• Campbell High School	1
• Pearl City High School	1
• Waianae High School	1
• Waipahu High School	5
• Waipahu Intermediate School	4
Private:	
• Hale O Ulu	1

Attachment A
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DISTRICT/SCHOOLS	NO. of WORKSHOP PARTICIPANTS
Windward District:	
Public:	
• Castle High School	6
• Kahuku High School	1
• Kailua High School	2
• Kalaheo High School	1
• Olomana	1
Private:	
• Kailua Christian Academy	1
• Redemption Academy	1

ANNOUNCING

HAWAIIAN ELECTRIC COMPANY'S

EMF EDUCATION PROJECT: TEACHER RESOURCE PACKET & WORKSHOP

HECO's EMF Education Project was developed to:

- address a public concern regarding EMF (electric and magnetic fields) and the effects on humans.
- provide high school (9-12) science teachers with a Teacher Resource Packet containing a Teacher's Resource Guide and current information on EMF.
- provide high school science teachers with a workshop to demonstrate the implementation of an issue-based program of study.
- provide each high school in the State of Hawaii with a magnetic field meter to enable the collection, organization, analysis and generalization of magnetic field readings/data.

PREREQUISITE:

- Participation in a HECO-sponsored EMF Education Project workshop.

WORKSHOP INFORMATION:

DATE:	Saturday, April 30, 1994
PLACE:	Honolulu Club Training Room #1 (Located between TGIFriday and the parking entrance to the Honolulu Club. Parking is available at the Neal Blaisdell Center for $3.00.)
TIME:	8:30 - 11:30 a.m.

REGISTRATION DEADLINE:

Tuesday, April 19, 1994

HAWAIIAN ELECTRIC COMPANY'S
EMF EDUCATION PROJECT

WORKSHOP REGISTRATION FORM

NAME: _____

SCHOOL: _____

HOME ADDRESS:

_____

_____

Home Phone: _____

SCHOOL ADDRESS:

_____

_____

School Phone: _____

PRINCIPAL'S SIGNATURE: _____ **DATE:** _____

If your school has not yet received a magnetic field meter, please indicate the name of your representative who is to receive the meter for your school:

_____

PLEASE RETURN COMPLETED REGISTRATION FORM TO:

Hawaiian Electric Company
Education and Consumer Affairs Division
P. O. Box 2750
Honolulu, Hawaii 96840-0001

REGISTRATION DEADLINE: Tuesday, April 19, 1994